No. 885,132. PATENTED APR. 21, 1908.

F. O. BALL.

ENGINE.

APPLICATION FILED JULY 16, 1907.

Fig. 1.

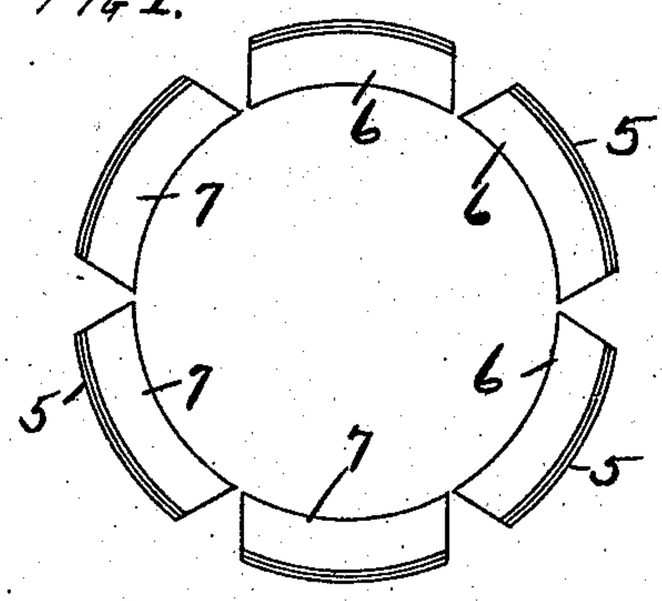
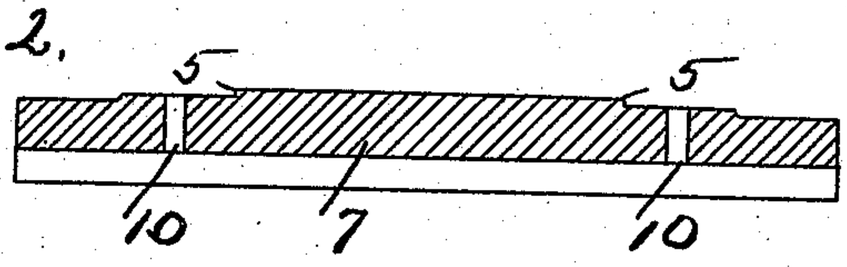


Fig. 2.



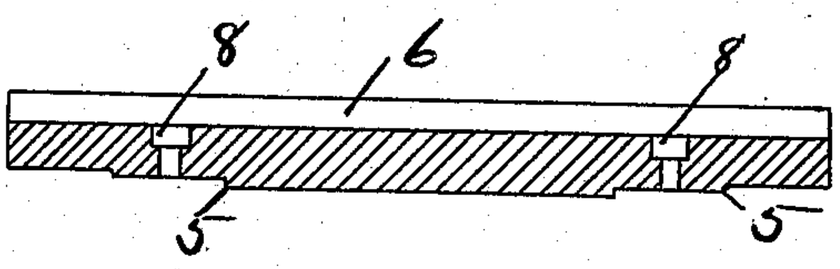


Fig. 3.

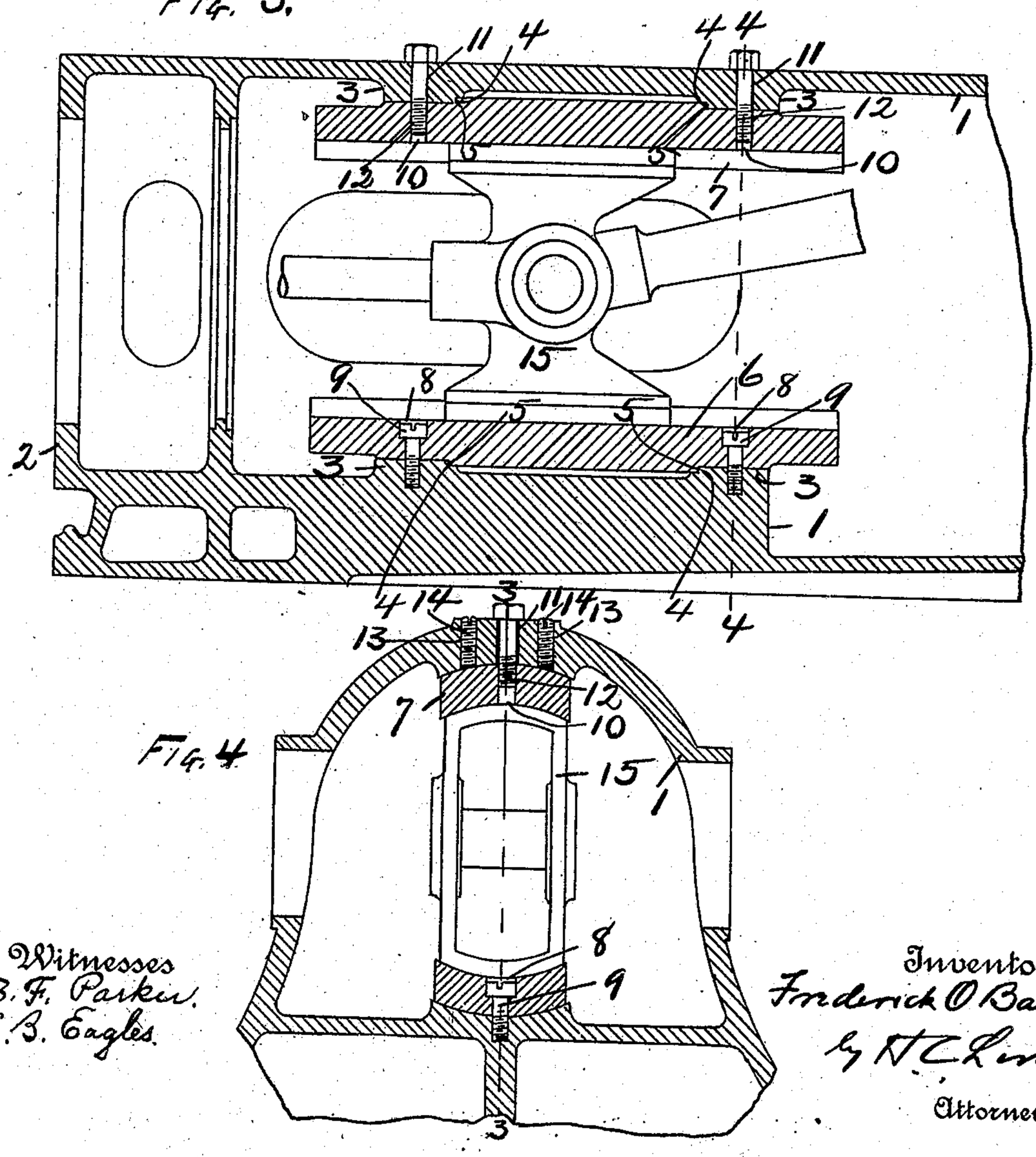


Fig. 4.

Witnesses
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UNITED STATES PATENT OFFICE.

FREDERICK O. BALL, OF NORTH PLAINFIELD, NEW JERSEY.

ENGINE.

No. 885,132. Specification of Letters Patent. Patented April 21, 1908.

Application filed July 15, 1907. Serial No. 383,916.

To all whom it may concern:

Be it known that I, FREDERICK O. BALL, a citizen of the United States, residing at North Plainfield, in the county of Somerset and State of New Jersey, have invented new and useful Improvements in Engines, of which the following is a specification.

This invention relates to engines and consists in certain improvements in the construction thereof as will be hereinafter fully described and pointed out in the claims.

More particularly the invention relates to an improvement in the construction and mounting of the cross head guides.

The invention is illustrated in the accompanying drawings as follows:

Figure 1 is an end view of a series of guides, indicating the method of manufacture. Fig. 2 a section of the two cross head guides detached, the section being on the line 3—3 in Fig. 4. Fig. 3, a section on the line 3—3 in Fig. 4. Fig. 4, a section on the line 4—4 in Fig. 3.

1 marks the engine frame; 2 the end of the frame to which a cylinder may be attached; 3—3, guide supports on the frame; 4—4 shoulders formed by said supports against which the shoulders 5 on the guides 6 and 7 abut to prevent end movement. The guide 6 is provided with the counter sunk holes 8. The screws 9 extend through these perforations 8 and are screwed into the supports 3. The guide 7 is provided with the screw threaded holes 10 and the supports 3 upon the upper side of the frame have the holes 11 through them. The bolts 12 extend through the opening 11 into the screw threaded openings 10 and by means of this the guide 7 may be secured in place.

In order to provide for the adjustment of the guides, I provide the supports 3 at the top of the frame with screw threaded openings 13, one at each side of the openings 11 and arrange the screws 14 in these openings. By turning the screws 14, the guide 7 may be adjusted as desired and when adjusted can be locked in adjustment by the bolts 12. The cross head 15 is of the ordinary construction.

Heretofore it has been common to make bored guides but the usual method has been to bore out the frame itself to form guides. Often a single defect in the casting alone necessitates the loss of the entire casting whereas with my construction the guide being made separately, this does not occur. Furthermore, where the guides are formed integrally with the frame, it is necessary to provide some means of adjustment for the cross head so that a much more expensive cross head is required than with my construction. It will be observed also, that with this construction the cross head guides can be adjusted while the engine is running. This, under certain conditions is very desirable. It is also a very cheap construction to manufacture because six guides, enough for three engines may be formed with one boring as shown in Fig. 1. After being bored, the different sections may be cut apart. This saving in the boring compensates for any extra labor there may be in fitting the guides to the frame.

What I claim as new is:

1. In an engine the combination with the frame of the cross head guides having opposed cylindrical guide surfaces, said guides being detachably secured to the frame and having their guide surfaces coincident with the same circle.

2. In an engine the combination with the frame having guide shoulders thereon transversely of the frame; of a cross head guide having a cylindrical guide surface provided with the shoulders adapted to engage the shoulders on the frame to prevent a movement of the guide axially with relation to the frame, said guide being detachably secured to the frame.

3. In an engine the combination with the frame having opposing guide supports thereon, said cross head guides having cylindrical guide surfaces said surfaces being coincident with the same circle, said guides being detachably secured to said supports and provided with means to lock the guides against longitudinal movement on the supports.

4. In an engine the combination of the engine frame having holes 11 and screw threaded holes 13 therein; a cross head guide arranged on the frame adjacent to said opening; the bolt 12 extending through the opening 11 securing the guide in place; and the screws 14 in the holes 13 for the purpose described.

5. In an engine the combination of the frame having guide supports 3 and provided with the shoulders 4; the guide 7 arranged on said supports and having the shoulders 5 abutting against the shoulders 4, the supports being provided with the holes 11 and screw threaded holes 13; the bolt 12 ar-

ranged in the holes 11 and screwed into the guides; and the screws 14 arranged in the holes 13 against the guides.

6. In an engine the combination with the frame 1 having the guide supports 3 with the shoulders 4 thereon; the guides 6 arranged on the lower supports having counter sunk openings 8 therein; the screws 9 in said openings for securing the guides to the supports; the guide 7 arranged on the top supports; the bolts 12 for securing the guide in place; and screws 14 abutting against the guide 7 for the purpose described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

FREDERICK O. BALL.

Witnesses:

F. H. Ball,

R. H. Brokaw.