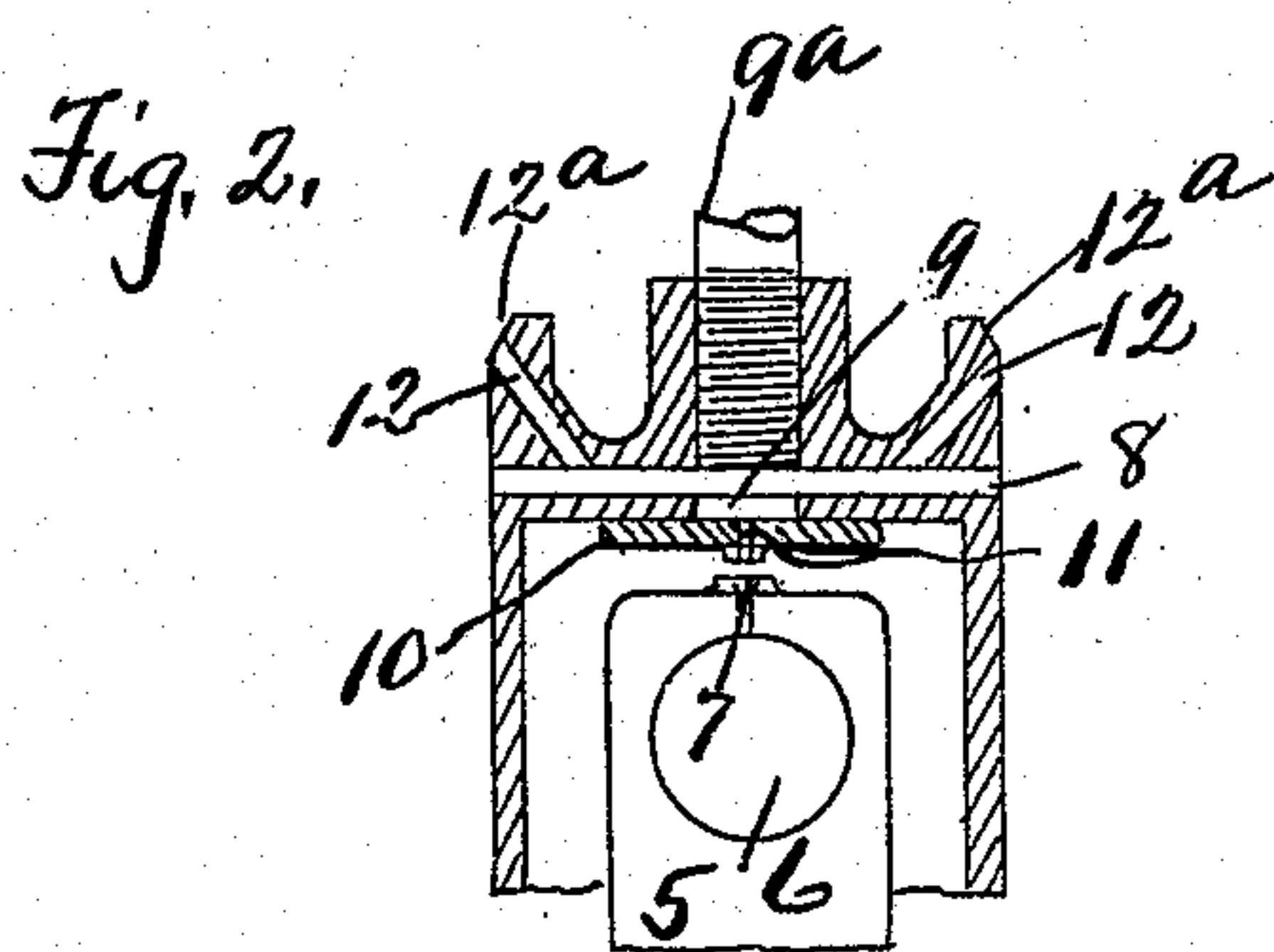
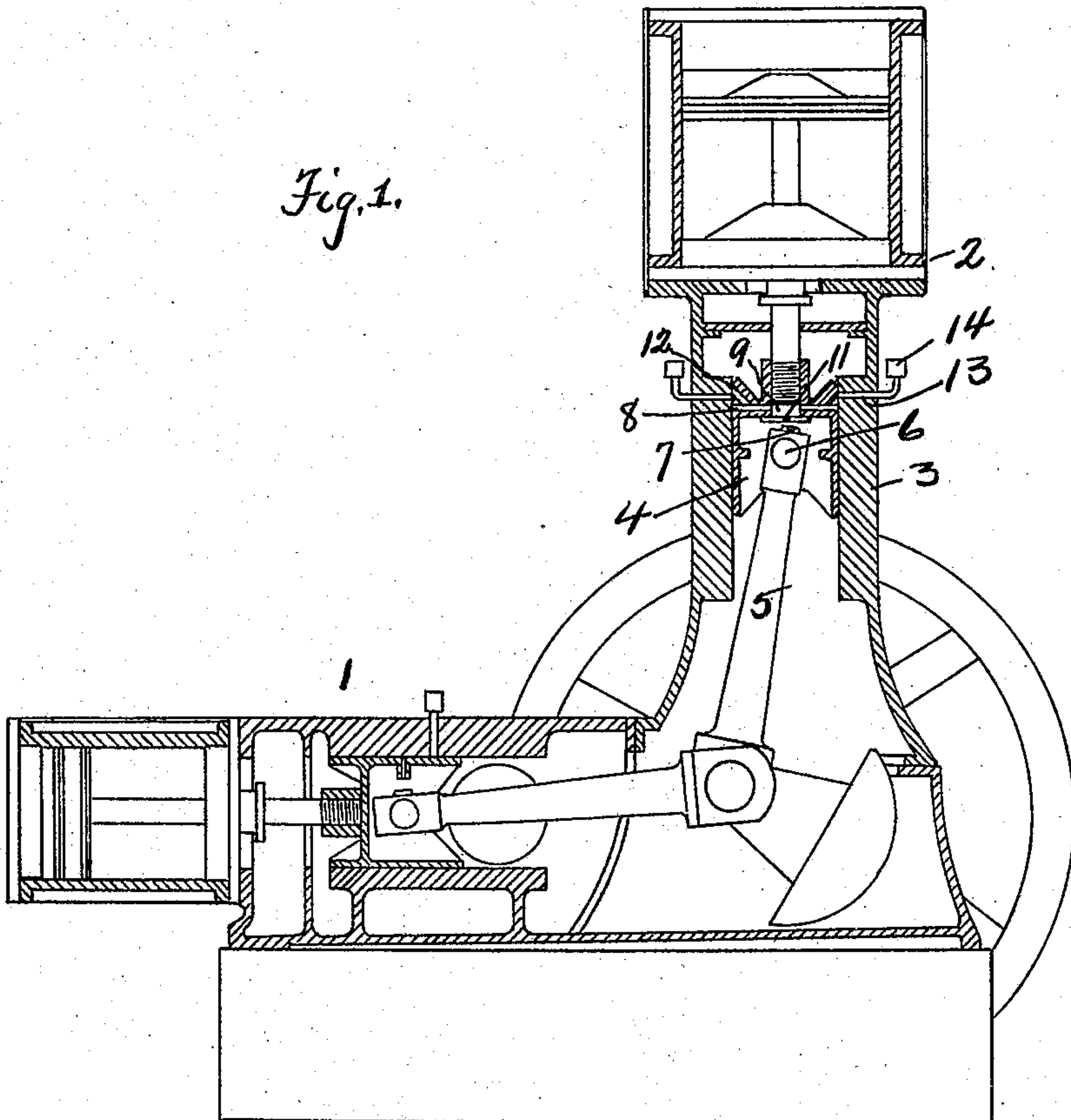


F. O. BALL.
ENGINE.

APPLICATION FILED FEB. 29, 1908.

907,948.

Patented Dec. 29, 1908.



Witnesses
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UNITED STATES PATENT OFFICE.

FREDERICK O. BALL, OF PLAINFIELD, NEW JERSEY.

ENGINE.

No. 907,948.

Specification of Letters Patent.

Patented Dec. 29, 1908.

Application filed February 29, 1908. Serial No. 418,420.

To all whom it may concern:

Be it known that I, FREDERICK O. BALL, a citizen of the United States, residing at 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.

The object of the invention is to provide a simple and efficient means for lubricating the cross head wrist pins of vertical reciprocating engines.

The invention is illustrated in the accompanying drawings as follows: Figure 1 shows a central vertical section through the engine. Fig. 2 a section through the cross head.

In the exemplification of the invention shown it is adapted to a vertical engine or a vertical horizontal engine. 1 marks the horizontal engine and 2 the vertical engine.

The cross head guides 3 of the vertical engine may be of any desired construction. The cross head 4 operates in these guides. Pitman 5 operates on the wrist pin 6. The pitman is provided with an oil opening 7 on its upper end.

The cross head is provided with an oil way 8 extending across it and connecting the surfaces of the cross head with the opening 9, this opening being the piston rod opening. The piston rod 9^a does not extend entirely through the opening, and the opening is closed by cap 10 in which is arranged an oil way directly over the opening 7 in the pitman. The cross head is provided with the oil ways 12 which extend upwardly from the way 8 and terminate near the upper ends of the cross head. The cross head is cut away at 12^a, so as to guide any oil that may be deposited upon the guide surfaces to the oil ways 12. The openings 13 extend through the cross head guides, and are connected with the oil cups 14.

Oil is supplied to the oil cups 14 and delivered from them through the openings 13 to the surface of the guides, thus lubricating the guides. Oil is also taken up by the

cross head and conducted through the ways 12 and 8 to the opening 9 from which it passes by gravity through the opening 11 into the opening 7, so that the cross head wrist pin is lubricated in this manner.

What I claim as new is:

1. In an engine, the combination of the vertical cross head guide having the oil passage 13 therein; the cross head having an oil way extending from the surface to a point over the pitman; a wrist pin on the cross head; and a pitman having an oil way in position to receive oil by gravity from the way in the cross head.

2. In an engine, the combination of a vertical cross head guide; means for delivering oil to the surface of the guide; a cross head having an oil way extending from the surface thereof to a point over the pitman, said cross head being adapted to take up the oil on the cross head guide and conduct it to said way; a wrist pin on the cross head; and a pitman having an oil way to receive oil by gravity from way in the cross head.

3. In an engine the combination of a vertical cross head guide; means for delivering oil to the surface of the guide; a cross head having the tapered end, and ways 12 and 8 leading from its surface to a central point in the cross head; a wrist pin in the cross head, and a pitman operating on the wrist pin, and having a way in position to receive oil from the way in the cross head.

4. In an engine, the combination of a vertical cross head guide having passages 13 leading to the surfaces of said guides; the cross head operating in said guides, having tapered ends and ways 12 and 8 leading from the surface to a central point thereof; a wrist pin and cross head; and a pitman on the wrist pin, said pitman having a way adapted to receive oil from way in the cross head.

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

FREDERICK O. BALL.

Witnesses:

A. K. SMITH,
F. H. BALL.