

No. 841,395.

PATENTED JAN. 15, 1907.

E. R. HEWITT.

CROSS HEAD PIN FOR EXPLOSION ENGINES.

APPLICATION FILED FEB. 23, 1906.

Fig. 1.

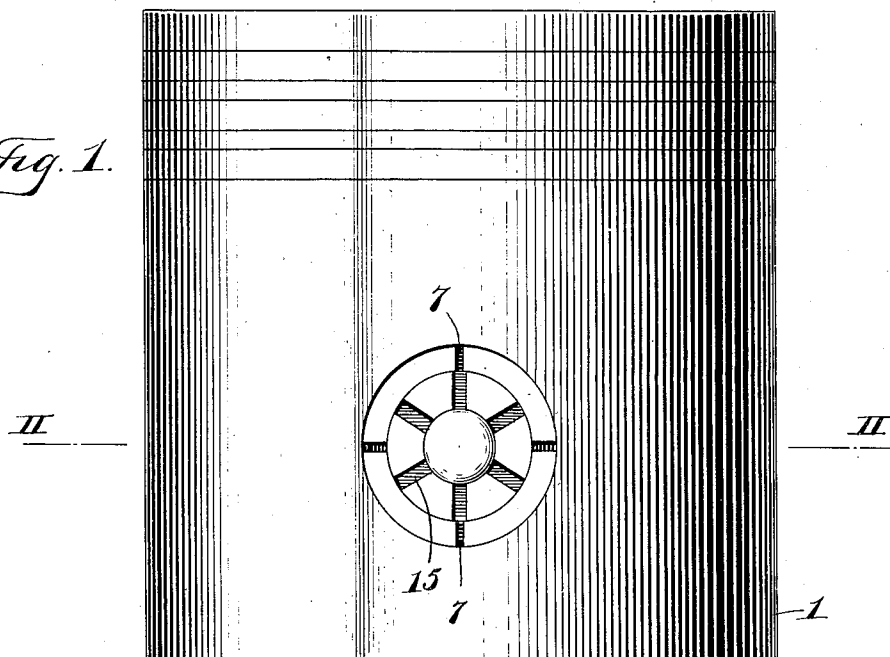
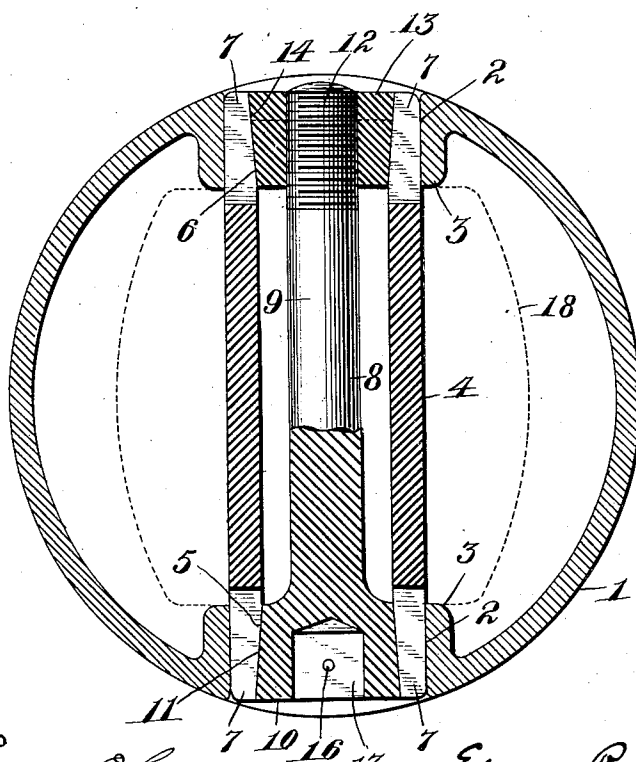


Fig. 2.



Witnesses

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CROSS-HEAD PIN FOR EXPLOSION-ENGINES.

No. 841,395.

Specification of Letters Patent.

Patented Jan. 15, 1907.

Application filed February 23, 1906. Serial No. 302,325.

To all whom it may concern:

Be it known that I, EDWARD R. HEWITT, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Cross-Head Pins for Explosion-Engines, of which the following is a full, clear, and exact description.

My invention relates to a pitman connection particularly adapted for explosion-engine cylinders, and has for its object to provide a pin connection between the piston and piston-rod which is absolutely rigid and which cannot work loose under any circumstances, so as to damage the mechanism.

A further object of the invention is to provide a convenient form of pin connection which is cheap to manufacture and easy to assemble into place.

With these and other objects in view my invention consists in the construction, combination, location, and arrangement of parts hereinafter set forth and shown, and finally particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side view of a piston having a pin connection embodying the principles of my invention applied thereto, and Fig. 2 is a sectional view on the line 2 2 of Fig. 1.

One of the structurally-weakest parts of an explosion-engine is the connection between the piston and the piston-rod, which virtually serves as the cross-head of the engine. The parts are located within the cylinder-walls so as to be almost inaccessible, and the nature of the explosion-engine imparts violent strains to the connection on account of the sudden and severe character of the cylinder-pressures during the explosions. In carrying out the present invention I aim to secure a form of pin connection between the piston and its piston-rod which is practically rigid with the piston and not liable to work loose under heavy or long-continued service.

Referring to the drawings, in which like parts are designated by the same reference-sign, 1 indicates the usual gas-engine piston, which may have the usual packing-rings thereon; but as the construction of the piston itself forms no part of the invention a detail description thereof is unnecessary.

2 indicates a diametral hole extending through both walls of the piston of a diameter equal to that of the desired pin connection. The walls and cylinder are preferably

strengthened by bosses 3 at the location of the openings 2.

I provide a hollow pin 4, adapted to closely fit the holes 2 in the cylinder-walls, and I have shown the ends of this hollow pin internally coned at 5 and 6 and provided with longitudinal slots or recesses 7.

8 denotes what I shall term an "expanding" wedge or plug, having a shank portion 9 with a head 10, which has an exteriorly-coned surface 11, corresponding to the inclination of the coned surfaces 5. The other end of the shank 9 is threaded, as shown at 12, so as to engage the nut 13, also having an exteriorly-coned surface 14, corresponding to the cone 11 of the opposite head. The nut 13 has diametrical slots 15, which may be engaged by a suitable tool for tightening the nut upon the shank 9.

16 denotes a pin which may be arranged so as to loosely engage the head end 10 of the shank with the surrounding hollow pin 4.

17 denotes a square hole in the head 10, by which the head may be held against rotation by a suitable tool when desired.

The method of assembling and the use of the device are as follows: The piston-rod being placed in position within the piston, as shown by dotted lines 18 in Fig. 2, the hollow pin 4 is inserted through the holes 2 and through the piston-rod, so as to occupy the relation shown. The expanding wedge or plug 8 is now inserted so that the lateral end or conical surface 11 engages the corresponding internally-coned wall of the pin 4. It is now merely necessary to tighten the nut 13 with a suitable tool, by which a very great force will be applied to expand the ends of the hollow pin 4, which are enabled to do this by virtue of the slots or recesses 7. The ends of the pin 4 are thereby expanded against the entire surface of the containing-holes 2, and it is evident that no ordinary vibration or shock will be sufficient to loosen the parts engaged in this way. The nature of the expanded ends also tends to centralize the pin within the containing-cylinder, so that even if under any contingency it should become loose it would not be so liable to move sideways and cut the cylinder-walls. After the engagement is complete and satisfactory pin 16 may be inserted to fix the head end of the expander against rotation, so that adjustments may afterward be made by the application of the tool to the nut 13 alone.

In addition to their function for permitting

the expansion of the hollow pin 4 the slots or recesses 7 serve as ducts for the admission of oil from the cylinder-walls to the pitman connection for lubricating it. This feature I regard as an important one, since this part receives a great deal of wear and its uniform lubrication is highly essential.

What I claim is—

1. A pitman connection for explosion-engines, comprising a hollow pin adapted to be received within the piston and having longitudinal slots or recesses at each end, an expanding-wedge having a head with a conical surface, and a nut having a correspondingly coned surface at the end opposite said head.

2. A pitman connection for explosion-engines, comprising a hollow pin adapted to be received within the piston, an expanding-wedge having a conical head within said pin, and having a nut with a coned surface opposite said head, said nut having diametral slots by which it is turned.

3. A pitman connection for explosion-engines, comprising a hollow pin having internally-coned surfaces at its ends, said ends being longitudinally recessed or slotted, an expanding-wedge within said pin comprising a threaded shank having a head with a conical surface opposite one end of the pin, and a nut on said threaded shank having a coned surface opposite said other end of the pin, said nut and head having means by which they may be engaged to be relatively turned so as to expand the pin within the usual diametral holes of the piston.

4. In an explosion-engine, a piston having diametrically opposite holes in its walls, a hollow pin contained within said holes, and having slotted or recessed ends, and an expanding-wedge arranged to expand said ends into engagement with the holes in the piston.

5. A pitman connection for explosion-engines, comprising a hollow pin having slotted ends adapted to be received in the usual diametral holes of the piston, a circular expanding-wedge within said pin and having oppositely-coned heads, means for drawing said heads toward one another, and a pin adapted to be inserted through one of the heads for fixing it against rotation.

6. In an explosion-engine, a piston having diametrically opposite holes in its walls, a hollow pin contained within said holes and having slotted or recessed ends and formed with an inward taper at such ends, and an expanding-wedge arranged to bear against each of said tapered portions to expand said ends into engagement with the holes in the piston.

7. In an explosive-engine, a hollow wrist-pin tapered on the interior toward the center, taper-plugs at each end fitting the interior of said pin, and means for simultaneously drawing said taper-plugs toward each other.

8. In an explosive-engine, a hollow wrist-pin tapered on its interior circumference, and tapered plugs for increasing the exterior diameter, said plugs having means for drawing them into the tapered interior of the pin toward the center thereof.

9. In an explosive-engine, a hollow wrist-pin tapered on its interior and slotted diametrically on the ends of the pin, and tapered plugs for expanding the end diameter of the pin by drawing said plugs into the interior thereof.

In witness whereof I subscribe my signature in the presence of two witnesses.

EDWARD R. HEWITT.

Witnesses:

JOHN M. CONNERY,
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