J. R. WARREN.

CASING FOR THE CRANK SHAFTS OF INTERNAL COMBUSTION ENGINES.

APPLICATION FILED FEB. 23, 1918.

1,293,266. Patented Feb. 4, 1919.

Fig. 1.

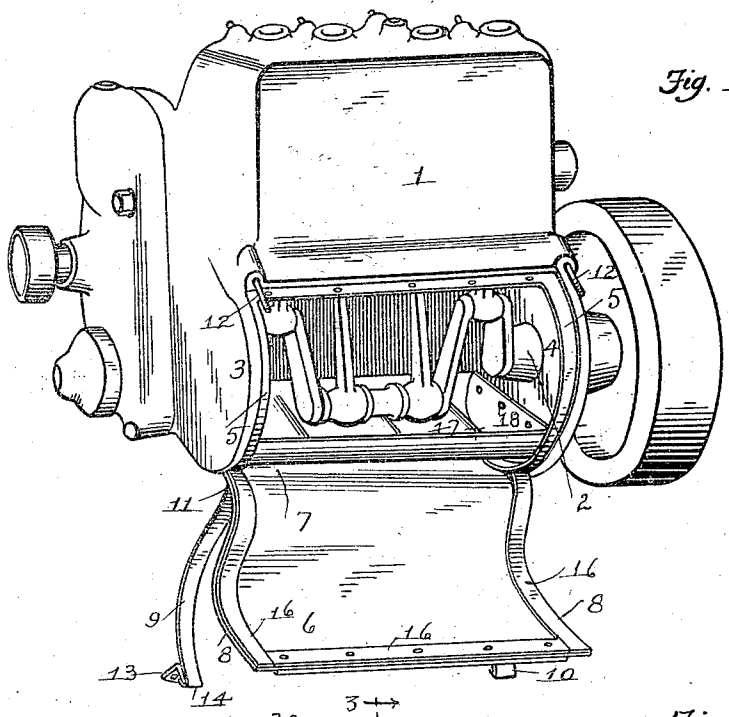


Fig. 2.

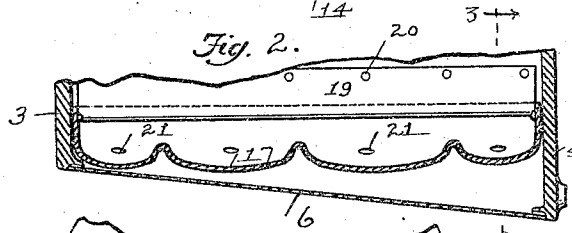
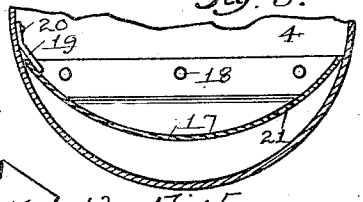


Fig. 3.



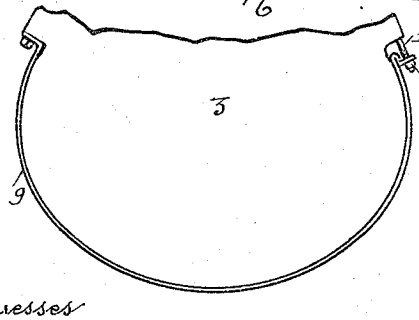
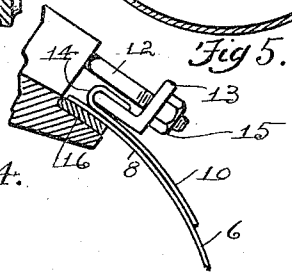


Fig. 4.

Fig 5.



Witnesses
W. W. Bradford
Robert N. Rice.

Inventor
John R. Warren
By Cyrus W. Rice
his Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN R. WARREN, OF GRAND RAPIDS, MICHIGAN.

CASING FOR THE CRANK-SHAFTS OF INTERNAL-COMBUSTION ENGINES.

1,293,266. Specification of Letters Patent. Patented Feb. 4, 1919.

Application filed February 23, 1918. Serial No. 218,683.

To all whom it may concern:

Be it known that I, JOHN R. WARREN, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented new and useful Improvements in Casings for the Crank-Shafts of Internal-Combustion Engines, of which the following is a specification.

The present invention relates to casings for crank shafts of internal-combustion engines, and its object is generally to provide an improved casing of that character; and further, to provide such a casing which may be readily opened and closed; and further, to provide such a casing having a member which may be releasably tightly clamped in closed position; and further, to provide an improved combined arrangement of a lubricant-containing vessel and an openable portion of the casing.

This and any other objects appearing hereinafter, are attained by, and the invention finds preferable embodiment in, the structure hereinafter described and illustrated by the accompanying drawings, in which:—

Figure 1 is a view in perspective of an internal-combustion engine, to which my casing is applied, and showing the openable member in open position;

Fig. 2 is a central vertical sectional view of the lower portion of said casing;

Fig. 3 is a transverse sectional view of the same taken on a vertical plane corresponding to line 3—3 of Fig. 2;

Fig. 4 is an end view of the casing; and

Fig. 5 is an enlarged detail view showing means for fastening the openable member in closed position.

In the embodiment of the invention chosen for illustration by the drawings and for detailed description in the body of this specification, the internal-combustion engine 1 has the crank shaft 2 inclosed by my casing. This casing has rigid end portions 3, 4, with arcuate edges 5. An openable lateral portion 6 of the casing is swingably mounted at one of its sides 7, and is adapted to be closed in such position that its end portions 8 bind or press against said arcuate edges respectively. This openable lateral portion is preferably of flexible material so as to be closely conformable to said edges, such swingable mounting thereof being in character a flexible hinge. Suitable bands 9, 10, outside said lateral portion and adjacent its ends respectively are swingably mounted in like manner at one of their ends 11 adjacent the swingable mounting of the lateral portion. Means are provided for clamping these bands over the end portions respectively of the closed lateral portions 6, such means preferably comprising the fixed threaded posts 12 on which slide the members 13 adapted to engage hooks 14 adjacent the free ends of the bands. The nuts 15 threaded on the posts outside said members 13 may be turned to draw the bands and bind or clamp the ends of the lateral portion 6 of the casing tightly between the bands and the arcuate edges 5; or, the nuts being unscrewed, the bands may be released and the lateral openable portion 6 may be opened as shown in Fig. 1. Suitable gaskets or packing members 16 may be employed as shown.

The vessel 17 adapted to hold lubricant is located above the lateral portion 6, being supported, as at 18, independently thereof. A lip portion 19 mounted, as at 20, adjacent and above one side of said vessel, extends downwardly over said side and is provided to prevent the lubricant from passing over or being splashed over said side.

The lateral portion 6 is inclined downwardly toward its end, as particularly shown in Fig. 2. The lubricant contained in the vessel 17 when it reaches the level of the passages 21 through the vessel's wall above its bottom, runs through said passages and along the inclined lateral portion to its lower end, whence it may be returned by a suitable pump (not shown) to the vessel.

The invention being intended to be pointed out by the claims is not to be limited to or by details of construction shown or described.

I claim:

1. In a casing for the crank shaft of an internal-combustion engine; rigid end portions having arcuate edges; a lateral portion swingably mounted at one side thereof; bands outside said lateral portion and adjacent its ends and swingably mounted at their ends adjacent the swingable mounting of the lateral portion; means for releasably fastening the free ends of the bands to clamp the bands around said arcuate edges with said lateral portion between the bands and said edges.

2. In a casing for the crank shaft of an

internal-combustion engine; rigid end portions having arcuate edges; a flexible lateral portion swingably mounted at one side thereof; bands outside said lateral portion and adjacent its ends and swingably mounted at their ends adjacent the swingable mounting of the lateral portion; means for releasably fastening the free ends of the bands to clamp the bands around said arcuate edges with said lateral portion between the bands and said edges.

3. In a casing for the crank shaft of an internal-combustion engine; rigid end portions having arcuate edges; a flexible lateral portion swingably mounted at one side thereof; means for releasably binding the ends of the lateral portion around said arcuate edges.

4. In a casing for the crank shaft of an internal-combustion engine; rigid end portions having arcuate edges; a lateral portion swingably mounted at one side thereof; screw-threaded means for tightly drawing and releasably binding the ends of the lateral portion around said arcuate edges.

5. In a casing for the crank shaft of an internal-combustion engine; rigid end portions having arcuate edges; a lateral portion swingably mounted at one side thereof; bands outside said lateral portion and adjacent its ends and swingably mounted at their ends adjacent the swingable mounting of the lateral portion and having hooks adjacent their free ends; fixed threaded posts; members adapted to be engaged by said hooks; nuts threaded on the posts and engaging said members and adapted thereby to tightly draw and releasably fasten the free ends of the bands for clamping the bands around said arcuate edges with said lateral portion between the bands and said edges.

6. In a casing for the crank shaft of an internal-combustion engine; end portions; a lateral portion swingably mounted at one side thereof; means for releasably binding the ends of the lateral portion around the edges of the end portions; a vessel adapted to hold lubricant and located above the lateral portion and supported independently thereof.

7. In a casing for the crank shaft of an internal-combustion engine; end portions; a lateral portion swingably mounted at one side thereof; means for releasably binding the ends of the lateral portion around the edges of the end portions; a vessel adapted to hold lubricant and located above the lateral portion and supported independently thereof; a lip portion mounted adjacent and above one side of said vessel and extending downwardly over said side and adapted to prevent the lubricant from passing over said side.

8. In a casing for the crank shaft of an internal-combustion engine; end portions; a lateral portion swingably mounted at one side thereof and inclined downwardly toward its end; means for releasably binding the ends of the lateral portion around the edges of the end portions; a vessel adapted to hold lubricant, and located above the lateral portion and supported independently thereof, and having lubricant-passages through its wall above its bottom.

In testimony whereof I have hereunto set my hand at Grand Rapids, Michigan, this 19th day of February, 1918.

JOHN R. WARREN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."