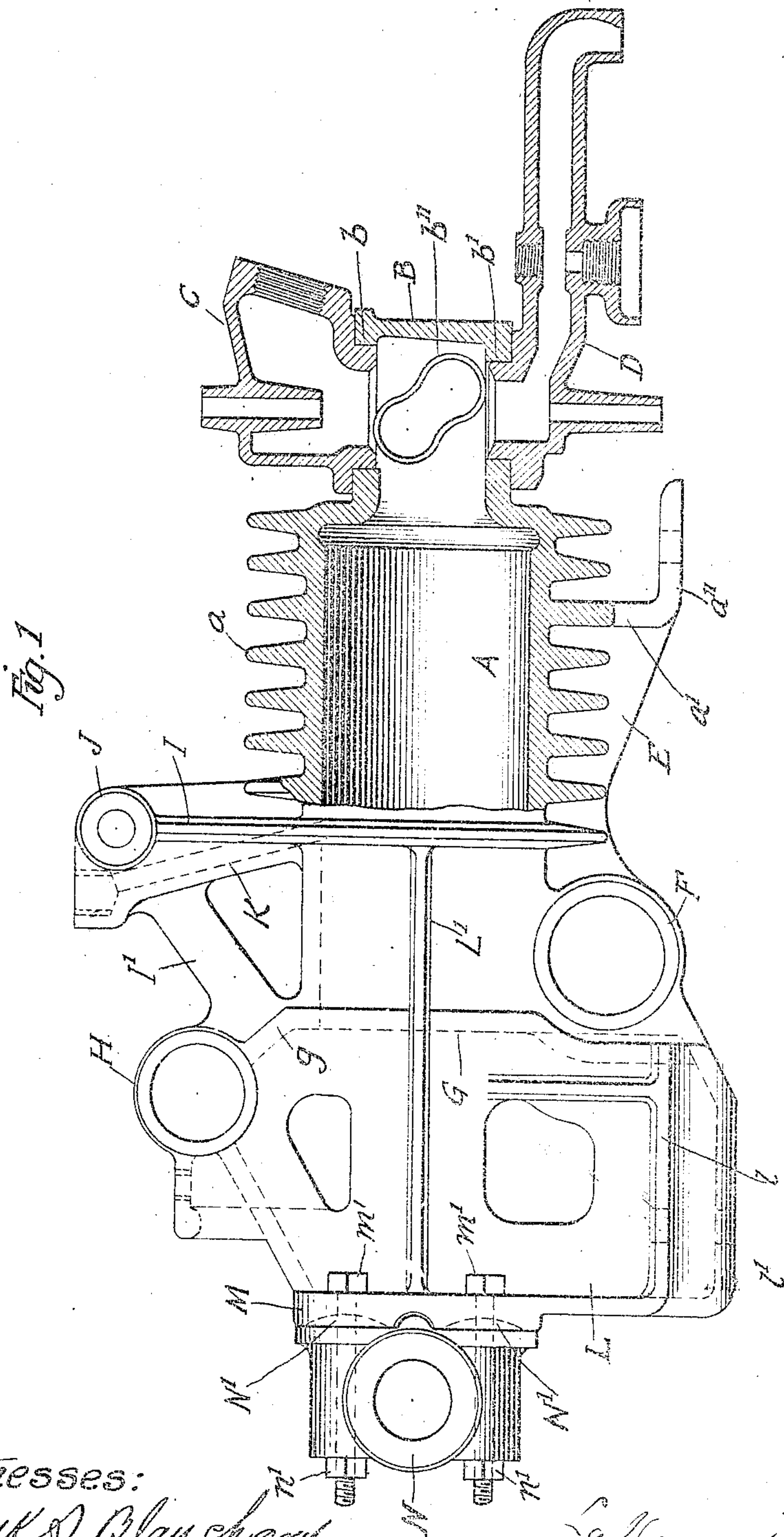


LA VERNE W. NOYES.  
 FRAME FOR INTERNAL COMBUSTION ENGINES.  
 APPLICATION FILED JUNE 4, 1909.

936,558.

Patented Oct. 12, 1909.

3 SHEETS—SHEET 1.



Witnesses:  
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 Thos. E. Cherry

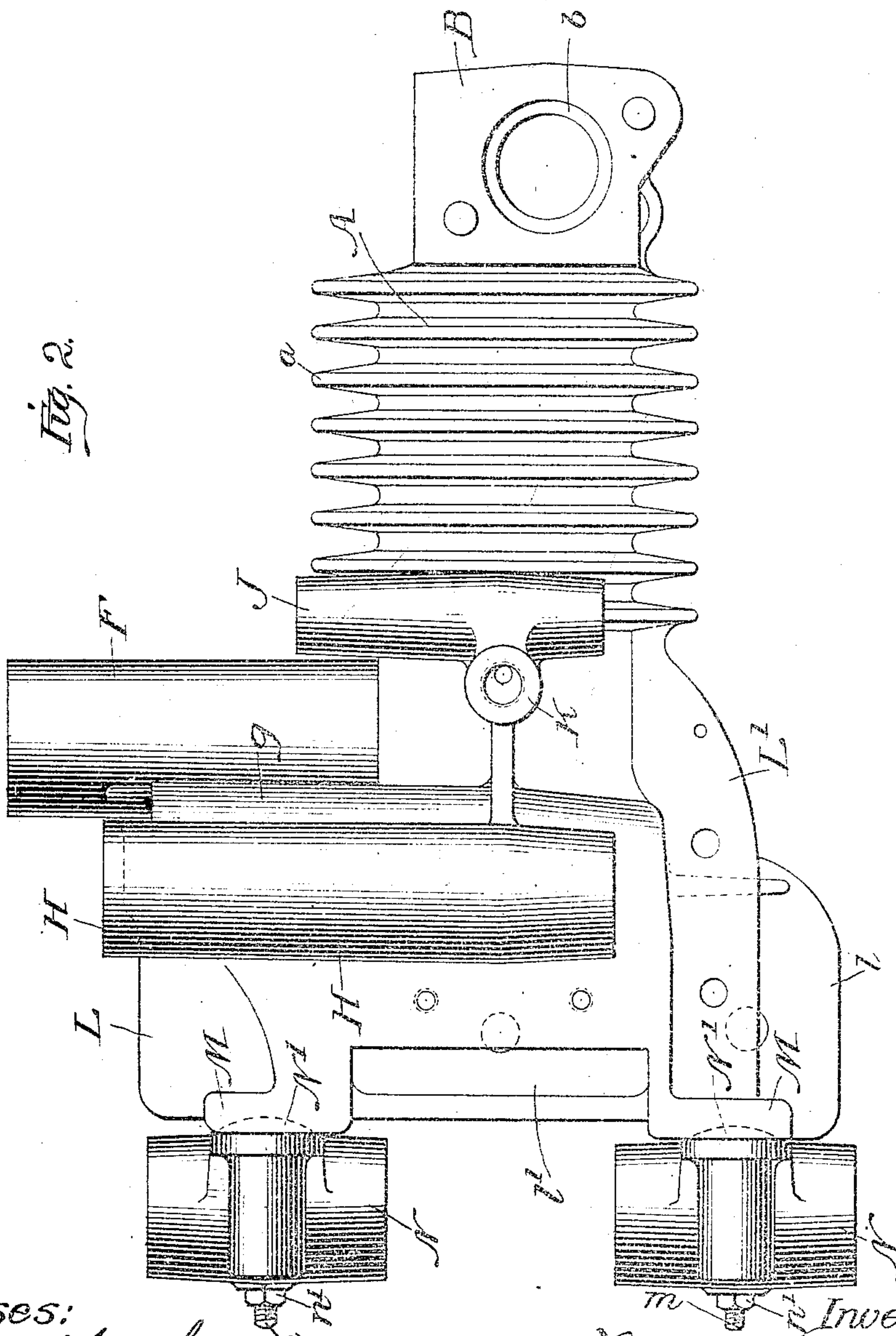
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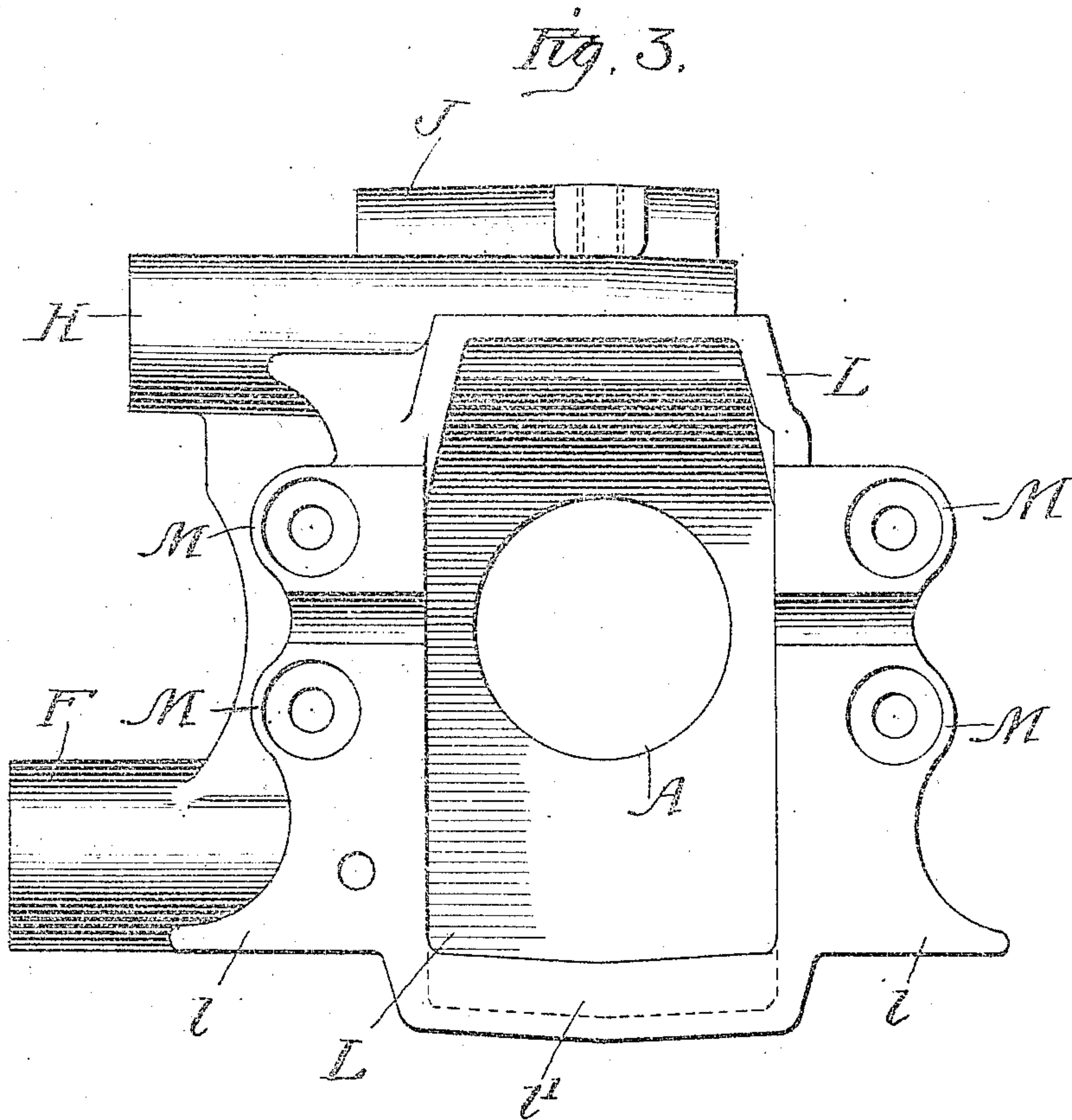
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Attorney



# UNITED STATES PATENT OFFICE.

LA VERNE W. NOYES, OF CHICAGO, ILLINOIS.

FRAME FOR INTERNAL-COMBUSTION ENGINES.

936,558.

Specification of Letters Patent.

Patented Oct. 12, 1909.

Application filed June 4, 1909. Serial No. 500,187.

*To all whom it may concern:*

Be it known that I, LA VERNE W. NOYES, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Frames for Internal-Combustion Engines, of which the following is a specification.

The present invention is not concerned with the moving, cooperating, working parts of the engine but relates exclusively to the frame by which said parts are carried.

The object of the invention is to provide a frame, of simple and durable construction, having and containing within itself, in compact form and arrangement, all of the parts or elements that are necessary to afford support and bearings for the moving parts.

To this end the invention consists in the features of novelty that are hereinafter described with reference to the accompanying drawings which form part of this specification and in which;

Figure 1 is a side elevation partly in section of an engine frame embodying the invention. Fig. 2 is a plan view thereof. Fig. 3 is a rear elevation thereof with bearings for the crank shaft removed.

A represents the cylinder at one end of which and in internal communication therewith is a substantially rectangular combustion chamber B. The combustion chamber has at top an opening *b* for communication with the exhaust-valve casing C. It also has at the bottom, an opening *b'* for communication with the inlet valve-casing D. It also has at one side an opening *b''* for the admission of the elements or members of the sparking or igniting device into the combustion chamber, the opening *b''* being normally closed by a cap plate. The cylinder has the customary circumferential ribs *a* which afford extended radiating surfaces. Projecting downward from one of these ribs is a web *a'* having a foot *a''* adapted to bear on any suitable support and perforated for the passage of anchor bolts.

Joining the web *a'* and extending rearward therefrom, and also joining the underside of the cylinder and its ribs *a* is a web E, the rear end of which joins a tubular

portion F, which is located below the cylinder and extends transversely thereof. This tubular portion affords a bearing for the shaft of the driven gear wheel. At one side of the cylinder it projects a considerable distance and is joined at one side tangentially, by a substantially vertical web G by which it is braced and strengthened.

The upper portion of the web G is slightly deflected from a vertical plane, as shown at *g*, and the deflected portion joins the lower side of a tubular portion H, which is located above the cylinder and extends transversely thereof, providing a bearing for the cam-shaft. This tubular cam-shaft bearing, also projects a considerable distance on one side of the cylinder and is, of course, braced and strengthened by the web G—*g*.

Extending upward from one of the ribs of the cylinder is a web I which joins and supports a tubular portion J which, of course is located above the cylinder and is disposed transversely thereto. This tubular portion provides a bearing for the valve-lever-shaft, and, in addition to the web I, the tubular portion is braced by a strut I'. It is also additionally braced by a hollow inclined part K, although this is not a primary function of the part K. It is hollow and is for the purpose of providing a duct for supplying a lubricant to the interior of the cylinder.

L is a housing at the rear end of the cylinder. It is in open communication therewith and is for the purpose of inclosing and protecting the crank-shaft end of the piston rod. At the bottom it has base flanges adapted to bear upon suitable supports and perforated for the passage of anchor bolts. The bottom of the housing consists of, or rather, forms a drip-pan L' having a suitable drain opening. Horizontal flanges or webs L', L'' extend, horizontally along the sides of the housing, and these serve not only the purpose of strengthening the structures, but one of them L', also serves as a means for the attachment of some of the working parts, to which end it is provided with suitably disposed perforations.

The side walls of the housing are provided at back with outwardly projecting lugs M which lie in the same vertical plane



and are perforated for the passage of bolts  $m'$ , each side wall being provided with two such lugs, located one above the other. Against each side wall is placed one of two members N of a two part tubular bearing adapted to the crank shaft. Each of these members N has two openings, disposed transversely with respect to the bearings for the passage of the securing bolts  $m'$  which pass through the lugs M and are adapted to receive securing nuts  $n'$ . Each of the members N has sphero-segmental bosses  $N'$  which surround the openings through which the bolts pass, respectively, and the lugs M have complementary sockets in which said bosses fit, so that the two members may be brought to perfect alinement.

With the exception of the exhaust-valve casing C, the inlet-valve casing D, and the members of the crank-shaft bearing, all of the parts above described are made of an integral casting and this is of great importance and advantage in the accurate building of the engine. It insures compactness, simplicity, economy and accurateness in construction. By the use of modern automatic machinery there is no chance for inaccuracy in the location of any of the cardinal features of the frame work, and in addition, there is not a multiplicity of parts secured together by bolts or equivalent devices which are not only apt to, but bound to become loose and throw the machine out of order.

What I claim as new and desire to secure by Letters Patent is:

1. An engine frame having a cylinder, a tubular part below the cylinder, providing a bearing for the shaft of the driven gear wheel, a tubular part above the cylinder providing a bearing for the shaft of the valve lever, and a tubular part, also above the cylinder, providing a bearing for the cam-shaft.
2. An engine frame having a cylinder, a tubular part below the cylinder, providing a bearing for the shaft of the driven gear wheel, a tubular part above the cylinder providing a bearing for the shaft of the valve-lever, and a tubular part, also above the cylinder, providing a bearing for the cam-shaft, all of said parts being integral whereby the several bearings are permanently fixed in their relations to each other.
3. An engine frame having a cylinder, a tubular part below the cylinder, providing a bearing for the shaft of the driven gear wheel, said tubular part being extended or projected, on one side of the cylinder, and a tubular part above the cylinder and extending or projecting beyond one side of the cylinder and providing a bearing for the cam-shaft.
4. An engine frame having a cylinder, a tubular part providing a bearing for the

shaft of the driven gear wheel, a tubular part providing a bearing for the shaft of the valve lever, and a tubular part providing a bearing for the cam shaft, all of said tubular parts lying transverse to the cylinder and being integral therewith.

5. An engine frame having a tubular part providing a bearing for the shaft of the driven gear wheel and tubular part providing a bearing for the cam shaft, each said tubular parts lying transverse to the cylinder and extending or projecting from one side thereof and both of said tubular parts being integral with the cylinder.

6. An engine frame having a cylinder, a housing at the rear end of the cylinder, the side walls of the housing being provided with sphero-segmental sockets, tubular members providing a bearing for the crank-shaft, said members being provided with complementary sphero-segmental bosses occupying said sockets, and means for securing said members to the side walls of the housing.

7. An engine frame having a cylinder, a web extending upward from the cylinder, a tubular part carried by said web, said tubular part being located above the cylinder and providing a bearing for the shaft of the valve-lever, a part located adjacent to said web and having a duct communicating with the interior of the cylinder, said parts being integral and affording mutual support to each other.

8. An engine frame having a cylinder, a tubular part below the cylinder, providing a bearing for the shaft of the driven gear wheel, a web projecting downward from the underside of the cylinder and having a supporting foot and a vertical web extending from the web last aforesaid, to said tubular part and joining them together, said web being integral with and longitudinal with respect to the cylinder.

9. An engine having a cylinder, a housing at the rear end of the cylinder, a horizontal web or flange projecting from the sides of the housing, the flange on one side of the housing having means for supporting some of the working parts of the engine.

10. An engine frame having a cylinder, a tubular part below the cylinder, providing a bearing for the shaft of the driven gear wheel, a tubular part above the cylinder providing a bearing for the shaft of the valve-lever, a tubular part also above the cylinder providing a bearing for the cam shaft and a combustion chamber located at one end of the cylinder and in internal communication therewith, all of said parts being integral.

11. An engine frame having a cylinder, a tubular part below the cylinder, providing a bearing for the shaft of the driven gear

wheel, a tubular part above the cylinder providing a bearing for the shaft of the valve-lever, a tubular part also above the cylinder providing a bearing for the cam shaft, a combustion chamber located at one end of the cylinder and in internal communication therewith, a web projecting downward from the underside of the cylinder and having a supporting foot and a vertical web extending from the web last aforesaid, said web 10 being longitudinal with respect to the cylinder, all of said parts being integral.

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