J. T. MOLTRUP.

CRANK CASE CONSTRUCTION FOR GAS ENGINES.

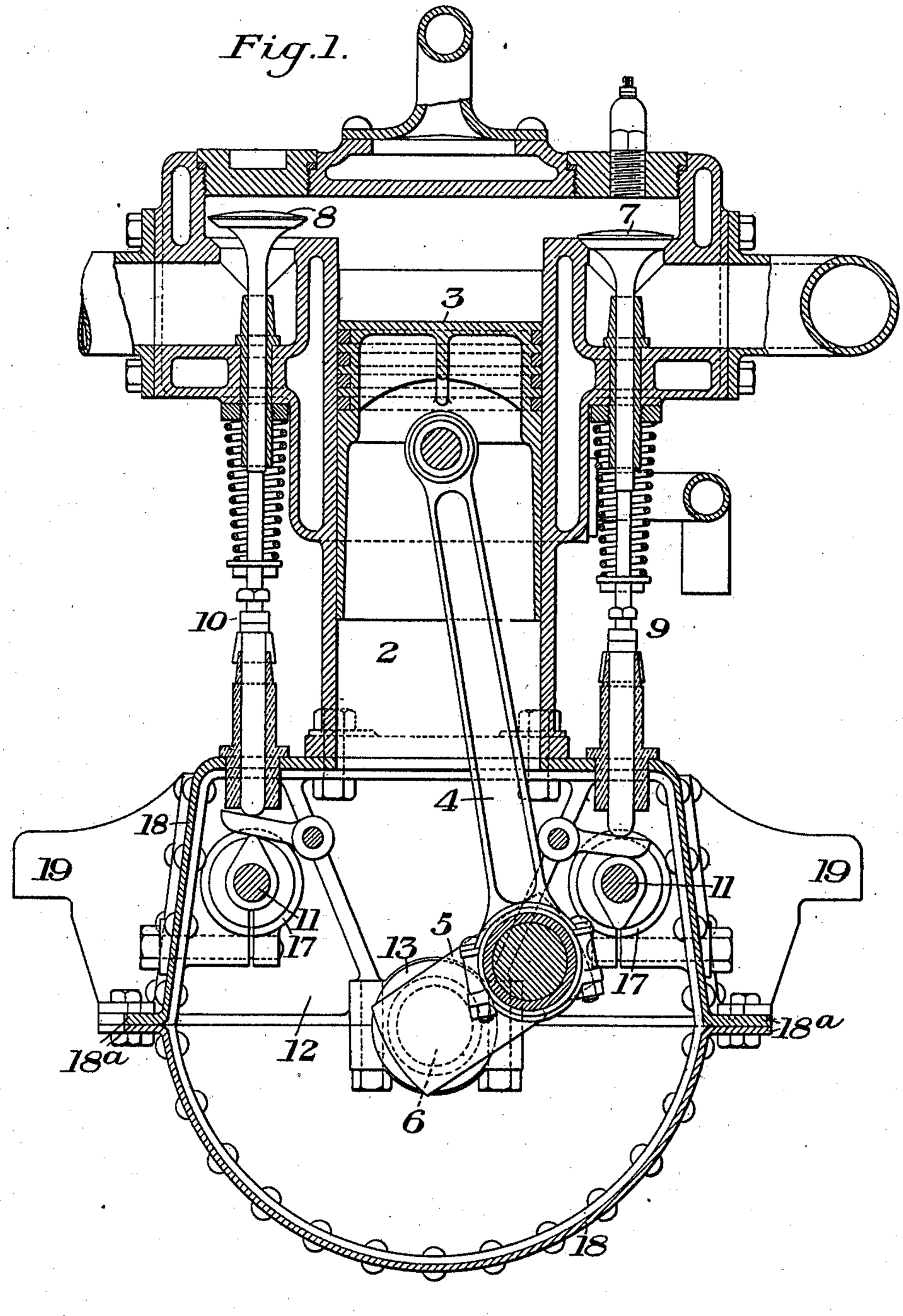
APPLICATION FILED APR. 24, 1908.

993,863.

Patented May 30, 1911.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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THE NORRIS PETERS CO., WASHINGTON, D. C.

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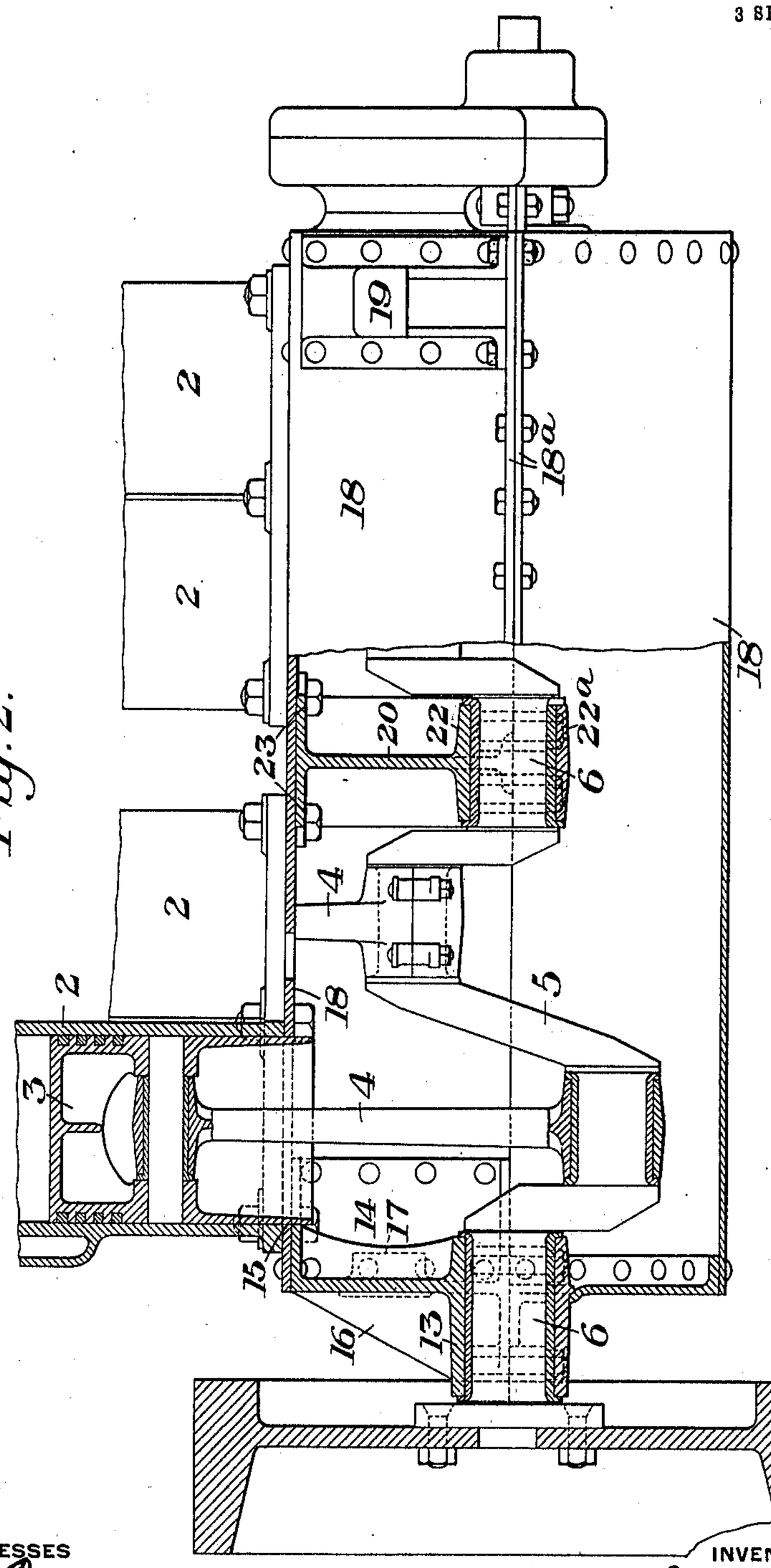
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

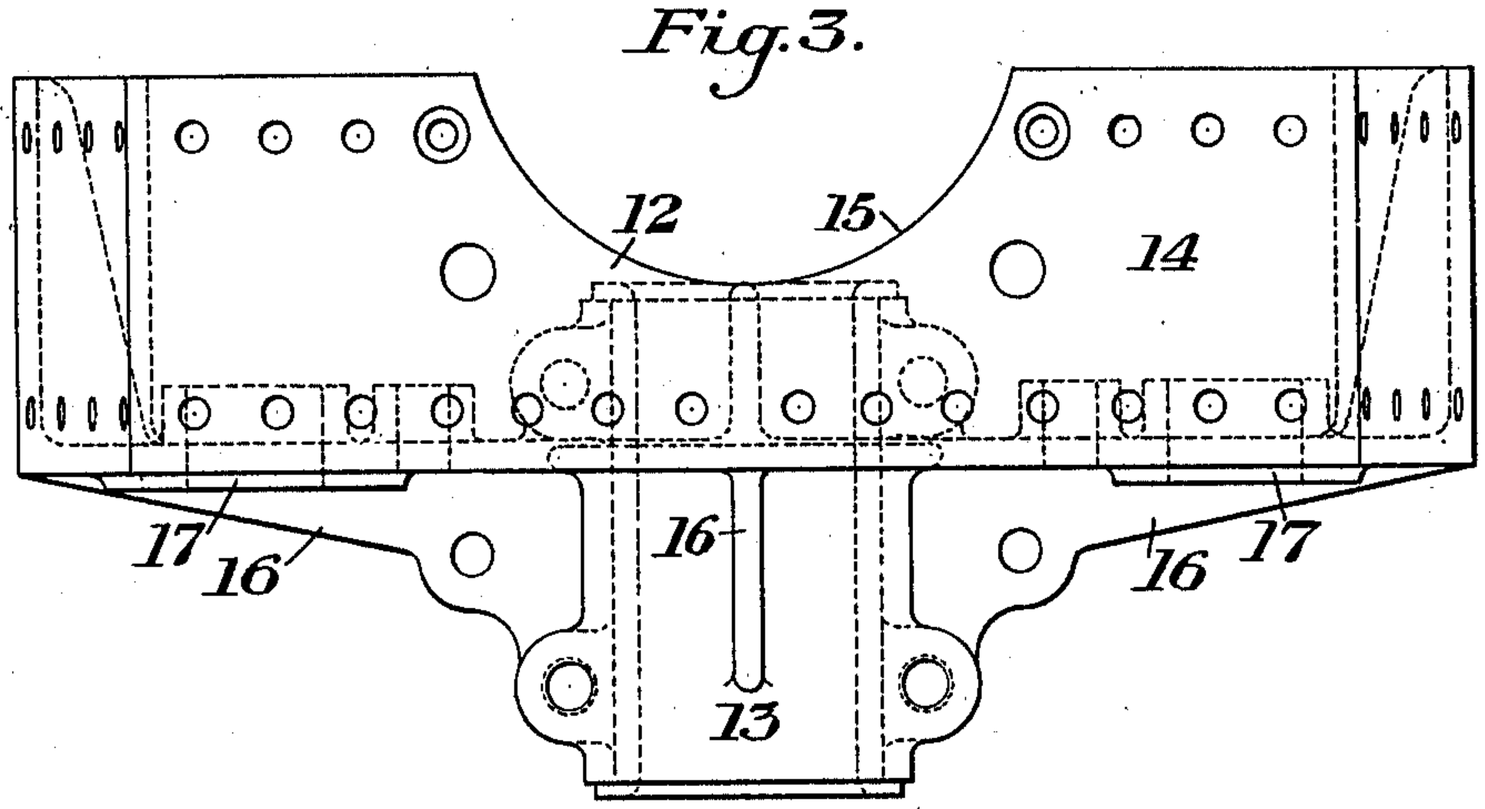


Fig. 4.

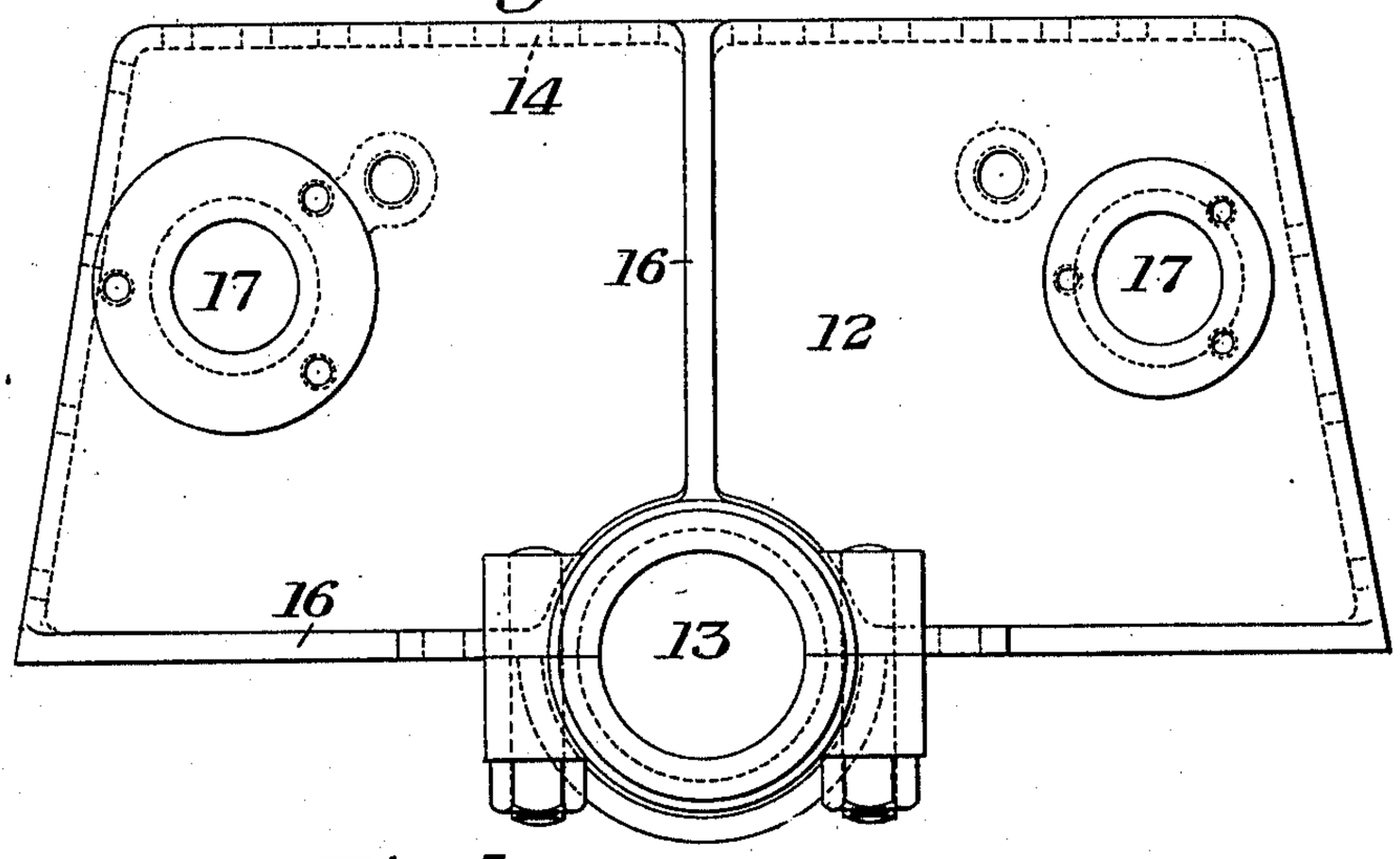
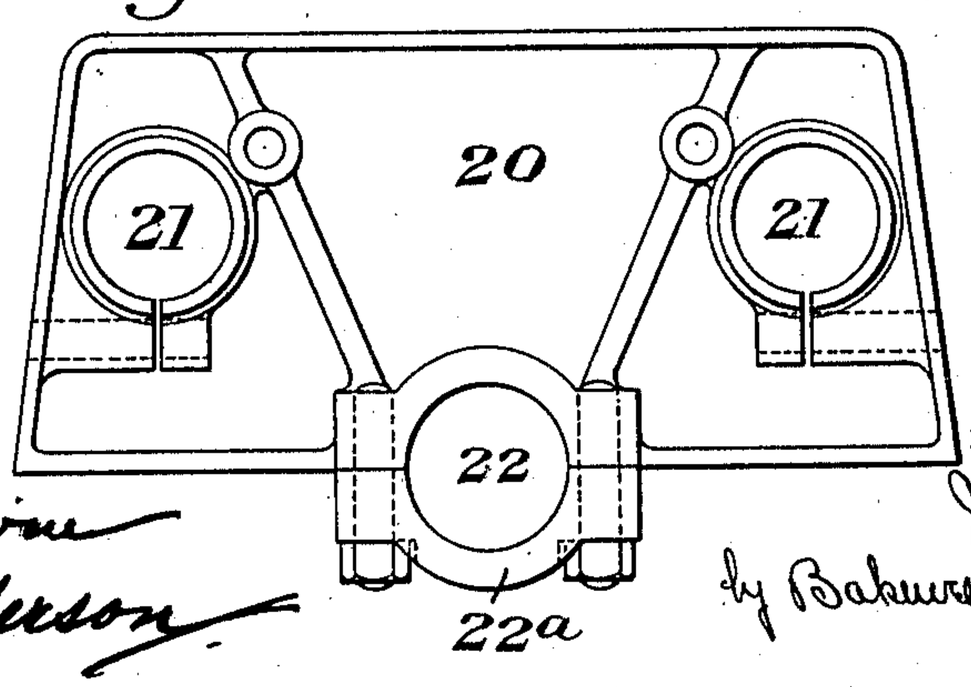


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES T. MOLTRUP, OF BEAVER FALLS, PENNSYLVANIA.

CRANK-CASE CONSTRUCTION FOR GAS-ENGINES.

993,863. Specification of Letters Patent. **Patented May 30, 1911.**

Application filed April 24, 1908. Serial No. 428,942.

To all whom it may concern:

Be it known that I, JAMES T. MOLTRUP, of Beaver Falls, county of Beaver, and State of Pennsylvania, have invented a new and useful Improvement in Crank-Case Constructions for Gas-Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section of a gas engine embodying my invention; Fig. 2 is a side view of the same, partly in section and partly broken away, with the cam shaft removed; Figs. 3 and 4 are respectively plan and end elevations of the upper portion of one of the crank case heads detached, and with the side-supporting lugs removed; and Fig. 5 is a detail view of the intermediate hangers or bearings on a smaller scale.

My invention has relation to a crank case construction for gas engines, and is designed to provide a crank case which shall be simple in its construction and strong and light.

The precise nature of my invention will be best understood by reference to the accompanying drawings, in which I have shown one embodiment thereof, it being premised, however, that various changes may be made therein by those skilled in the art, without departing from the spirit and scope of my invention, as defined in the appended claims.

In the drawings, the numeral 2 designates the cylinders of a multiple cylinder gas engine. 3 designates one of the pistons; 4 the pitman which connects it with the crank 5 of the crank shaft 6, which is common to all the cylinders; 7 the inlet valve for said cylinder, and 8 the outlet valve. 9 and 10 designate the connections for operating said valves, which connections are operated by cam shafts 11, which extend through the crank case. These parts may be of any suitable character, as my invention relates solely to the construction of the crank case and to the manner of supporting the cylinders thereon.

My improved crank case consists of heads 12, preferably castings of the form best shown in Figs. 3 and 4. Each of these heads has an extended divided bearing 13, for the crank shaft and is formed with an inwardly projecting flange portion 14, cut away at 15 for the end cylinder. These heads and bearings are preferably reinforced by the webs 16. The portion of each head below the divided bearing may be and preferably is, composed of a separate piece of lighter metal, as clearly shown in Fig. 2. Each head also contains bearings 17, for the cam shafts 11. Riveted or otherwise firmly secured to the flange portions 14 of the heads and connecting the same is a sheet metal casing 18, which is preferably formed in two sections united by the bolted flange 18ª. Each head is also provided with laterally projecting shouldered lugs 19, by means of which the crank case is supported on the engine frame (not shown). These lugs are shown as being secured by riveting to the heads and their flanges 14 through the casing. Intermediate the two heads is a hanger or bracket 20, which has bearings 21, for the cam shafts 11 and also a bearing 22 for the crank shaft. This hanger is bolted or otherwise secured to the metal casing 18, as shown at 23, in Fig. 2. This hanger is shown as being of I-beam form in cross section, its upper flanges being extended laterally underneath a portion of the adjacent cylinder seats. The bearings 21 are preferably split, as indicated in Fig. 5, and the bearing 22 has a removable cap section 22ª.

The upper section of the metal casing 18, preferably has its flat top portion of greater thickness than its side portions, the rolling flanges 18ª being also of greater thickness than the side portions. This enables the thicker portions to be machined for proper fitting without unduly thinning them, and gives greater strength where most needed, without increasing the weight of the side portions.

It will be seen that the end cylinders are supported on the flange portions 14 of the two heads, while the intermediate cylinders are supported largely on the hanger or bracket 20, thus relieving the metal casing 18 largely of the weight of the cylinders and enabling such casing to be made of relatively thin light sheet metal.

The heads of the crank case being in the form of castings can be made sufficiently strong to provide the main bearings for the crank shaft and to carry the weight of the cylinders.

The construction is as a whole very simple and strong and can be readily assembled. I do not, however, limit myself to the exact form of construction which I have shown and described, since various changes may be made therein without departing from

the spirit and scope of my invention. Thus, the form of the end heads and of the intermediate bracket or hanger may be changed, and one or more of the intermediate hangers may be provided, according to the length of the crank case.

I claim:

1. In a gas engine, a crank shaft, a plurality of cylinders having their pistons connected to said shaft, and a crank casing, said casing comprising separate rigid heads having bearings for the crank shaft, and a sheet metal casing secured to said heads and provided with seats for the cylinders, said heads having inwardly projecting longitudinal flanges to which the sheet metal casing is secured, said flanges being extended underneath the adjacent cylinder seats of the sheet metal casing; substantially as described.

2. In a gas engine, a crank shaft, a plurality of cylinders having their pistons connected to said shaft, and a crank case, said case comprising separate rigid heads carrying end bearings for the crank shaft, a sheet metal casing, lateral supports for said casing secured to said heads, the upper portion of the sheet metal casing being provided with seats for the cylinders, and the heads having inward projections extending underneath the adjacent cylinder seats to thereby support the same; substantially as described.

3. In a gas engine, a crank shaft, a plurality of cylinders having their pistons connected to said shaft, and a crank case, said case comprising separate rigid heads carrying end bearings for the crank shaft, a sheet metal casing, lateral supports for the casing secured to said heads, the upper portion of the sheet metal casing being provided with seats for the cylinders, and the heads having inward projections extending underneath the adjacent cylinder seats to thereby support the same, the sheet metal casing also having an intermediate bracket or hanger secured to and suspended from its upper portion, said bracket or hanger having a bearing for the crank shaft and also having flanges which extend underneath the adjacent cylinder seats at each side of the bracket or hanger; substantially as described.

4. In a gas engine, a crank shaft, a plurality of cylinders having their pistons connected to said shaft, and a crank casing, said casing comprising separate rigid heads having bearings for the crank shaft, and a sheet metal casing secured to said heads and provided with seats for the cylinders, said heads having inwardly projecting longitudinal flanges to which the sheet metal casing is secured, said flanges being extended underneath the adjacent cylinder seats of the sheet metal casing, and lateral supporting lugs for said casing which are secured to the flanges of the heads; substantially as described.

5. In a gas engine, a crank case head, comprising a casting provided with a divided bearing for the crank shaft, said casting also having an inturned riveting flange and a horizontal flange at its upper portion which extends inwardly to form a cylinder support, together with a sheet metal case body overlying said horizontal flange and secured thereto and also to the inturned riveting flange of the head, substantially as described.

In testimony whereof, I have hereunto set my hand.

JAMES T. MOLTRUP.

Witnesses:
H. M. CORWIN,
GEORGE H. PARMELEE.

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