Dec. 10, 1929. S. L. NORTON 1,738,963

MECHANICAL MOVEMENT

Filed July 30, 1928

Fig. 1.

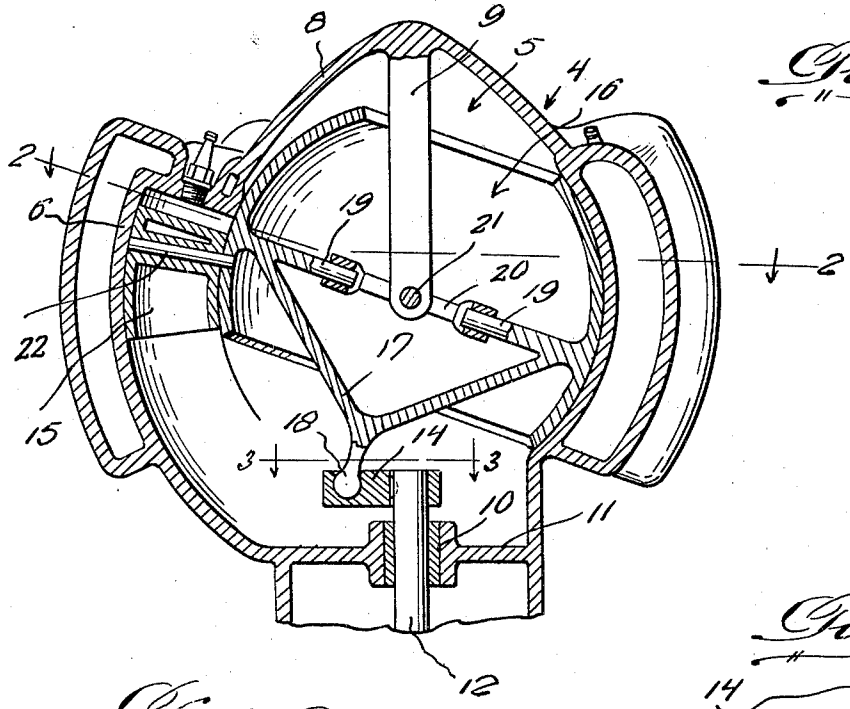


Fig. 3.

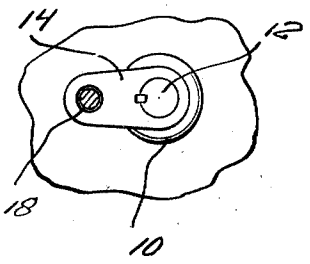
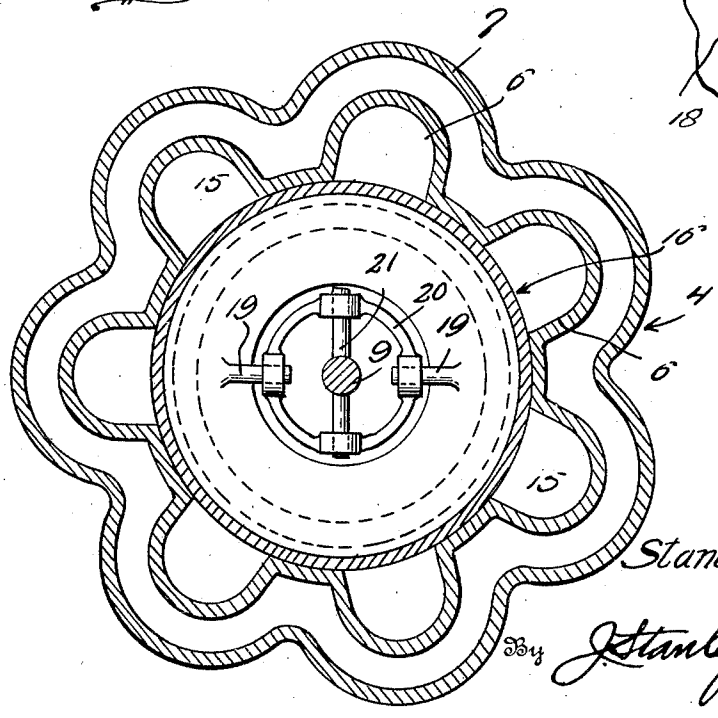


Fig. 2.



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UNITED STATES PATENT OFFICE

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MECHANICAL MOVEMENT

Application filed July 30, 1928. Serial No. 296,135.

This invention relates to an improved mechanical movement embodied in an internal combustion engine, but equally well adapted for incorporation in a steam engine, air motor or the like, the same being designed to convert reciprocatory motion of a multiple piston structure into rotary motion for a power or propeller shaft.

The invention has more particular reference to that class which utilizes a rotary propeller shaft, a casing embodying a plurality of spaced parallel explosive cylinders disposed concentrically with respect to the shaft, reciprocatory pistons movable in the cylinders and a novel operating connection between the pistons and the shaft which, in the present instance, constitutes the primary factor of the movement and is in the form of an oscillating actuator.

My principal object is to generally improve upon known patented and used structures of this class by providing one which is characterized by a peculiarly shaped casing having a portion constructed to accommodate a distinctive type of oscillating actuator, the same being so designed as to compensate for necessary relative motion between parts, while yet maintaining appropriate movement for imparting motion to the propeller shaft in a dependable manner.

A further object is to provide a simplified organization of parts constructed and cooperating in a manner for compactness and convenience of arrangement and reliability in operation and transmission of power.

Other features and advantages of the invention will become more readily apparent from the following description and drawing.

In the drawing:

Figure 1 is a fragmentary view in section and elevation showing an engine constructed in accordance with the present invention.

Figure 2 is a horizontal section taken approximately upon the irregular plane of the line 2—2 of Figure 1.

Figure 3 is a detailed section taken on the line 3—3 of Figure 1.

In carrying out the invention I provide, as before intimated, a peculiarly shaped casing which is generally designated by the reference numeral 4 and which is distinguished by a central chamber 5 surrounded by circumferentially spaced or radial explosive cylinders 6. It is to be noted from Figure 2 that each cylinder is substantially channel-shaped in cross section and embodies an outer curved wall and straight side walls. The cylinder in each instance is open on its inner side for communication with the chamber 5. Cooperating with the cylinders are water jackets 7. That part of the casing defining the chamber 5 and indicated by the reference character 8 is provided with a centralized hanger 9 disposed in axial alinement with a bearing 10 in the partition 11. The bearing 10 serves to accommodate the rotary power or propeller shaft 12, which as is evident from Figure 1 is equipped with a crank arm 14.

It will be observed from Figure 1 that the cylinder 6 is of somewhat longitudinally bowed form and serves to accommodate a correspondingly shaped reciprocatory piston 15 which in practice is operated from a suitable source of ignition, fuel supply, intake and exhaust valves, etc. Since however these parts constitute no part of the novelty they are not detailed.

Attention is next invited to the oscillating actuator, the same being generally designated by the reference numeral 16. It is of spherically segmental hollow form and fits snugly within the chamber 5 as shown in Figure 1. It is open at opposite ends and is formed with a central diaphragm 17 of conical configuration whose apex portion carries a coupling finger 18 having ball and socket connection with the aforesaid crank arm 14. Formed integral on the diaphragm 17 at diametrically opposite points are inwardly extending studs 19 pivotally connected with an annulus 20 which is suspended from the hanger 9 through the medium of a fulcrum pin 21. Thus, a universal connection is afforded between the hanger 9 and the actuator 16 permitting it to have the desired wobbling motion in the various sweeping directions. Formed on the peripheral portion of this actuator opposite each cylinder is a pivot pintle 22 extending into a complemental cylinder and affording a rockable connection or mounting for the

piston. This freedom of motion apparently does not aid in the transmission of power but is essential to compensate for relative movement between parts to effect unhindered operation.

The reciprocatory pistons function in the usual manner of a two or four cycle engine, and in the same order as radial cylindered engines. As the pistons are thus fired, the oscillating actuator will be impelled to rotate on an infinite number of axes, thus producing a force which is imparted to the rotary power shaft 12 through the eccentric crank arm 14.

A careful consideration of the description in conjunction with the drawing will clarify the construction advantages and operation of the invention. Therefore, a more lengthy description is regarded unnecessary.

I claim:

1. In a structure of the class described, a casing embodying a centralized spherically segmental shaped portion defining an actuator chamber, circumferentially spaced cylinders surrounding said chamber and in open communication therewith, a rotary power shaft mounted in the casing and provided with a crank arm, a hanger in said chamber in alinement with said shaft, a segmentally shaped spherically oscillating actuator in said chamber having universal connection with said hanger and eccentric ball and socket connection with said crank arm, peripheral pintles on the actuator extending into the cylinders, and pistons slidable in the cylinders and mounted for movement on said pintles.

2. In a structure of the class described, a casing embodying a substantially spherically segmental shaped central portion defining an actuator chamber, said casing being further constructed to provide surrounding circumferentially spaced longitudinally curved cylinders having open communication with the chamber, a hanger in said chamber, a bearing in the casing in alinement with said hanger, a shaft mounted for rotation in the bearing, a crank arm on the shaft, an annulus surrounding said hanger, a pivotal connection between the annulus and hanger, a segmentally shaped spherically oscillating actuator in said chamber embodying a diaphragm having studs pivotally connected with said annulus, said diaphragm having an extension operatively joined with said crank arm, outstanding pintles carried by the peripheral portion of the actuator and extending into the cylinders, and pistons slidable in the cylinders and mounted on said pintles.

In testimony whereof I affix my signature.

STANLEY L. NORTON.