April 16, 1946. C. H. WOODS 2,398,486

MECHANICAL MOVEMENT

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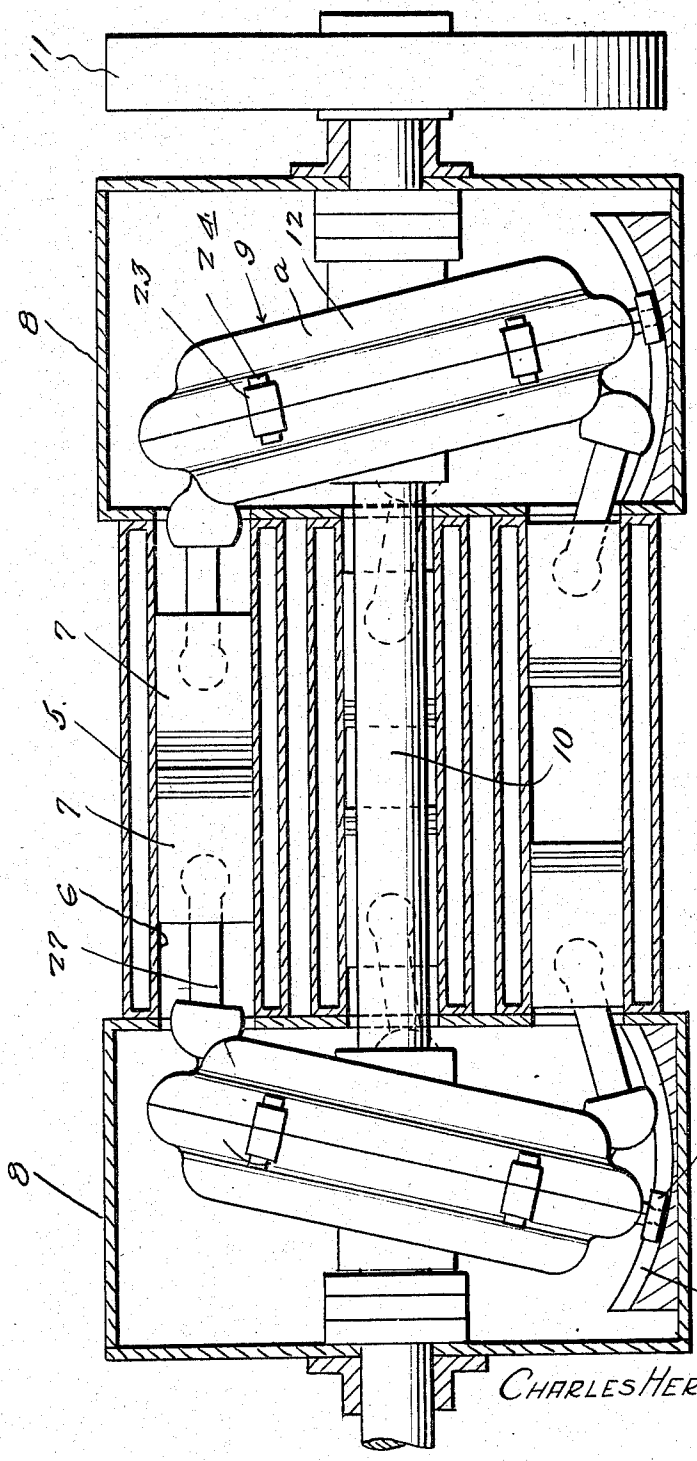


Fig. 1.

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Fig. 2.

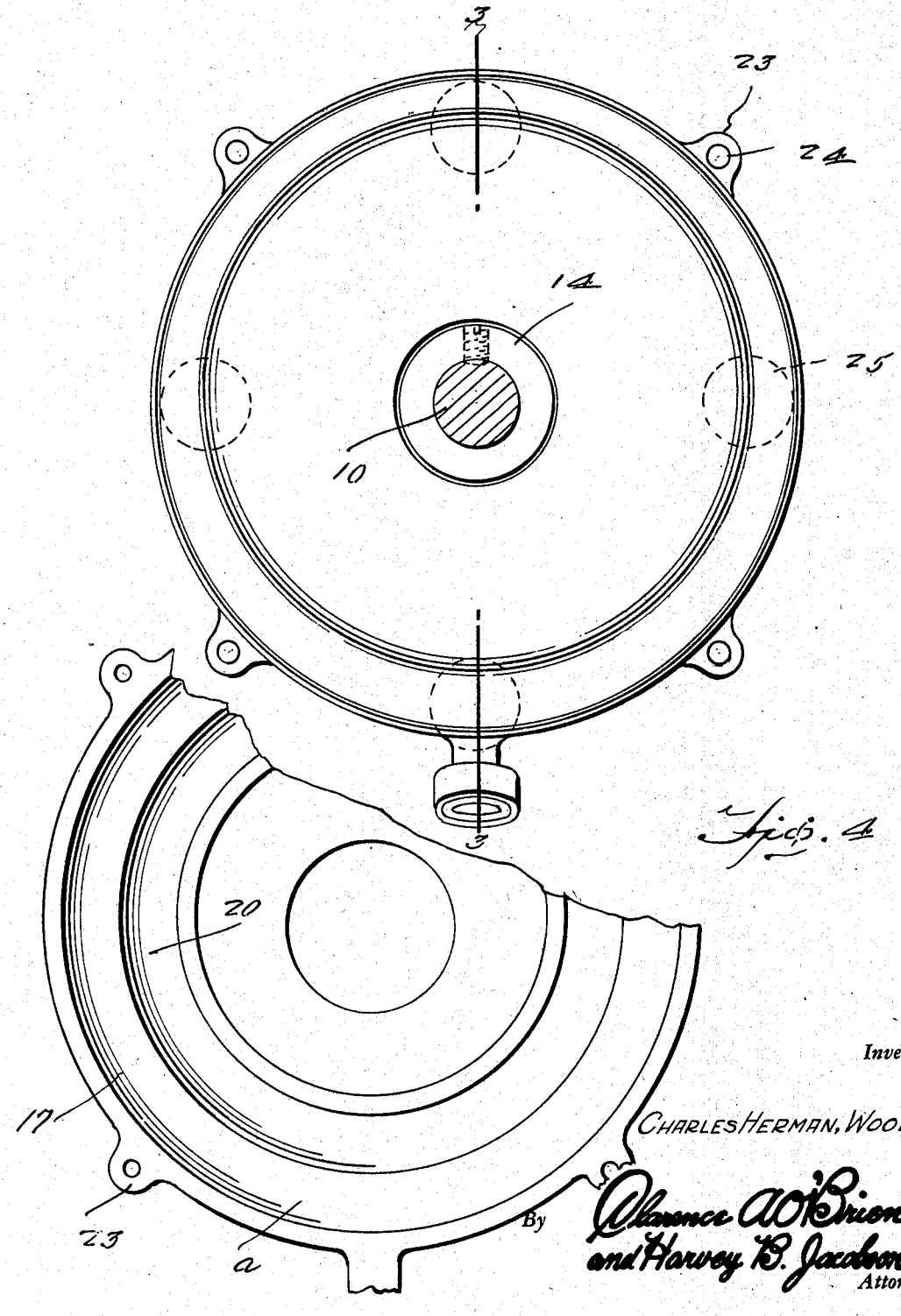


Fig. 4

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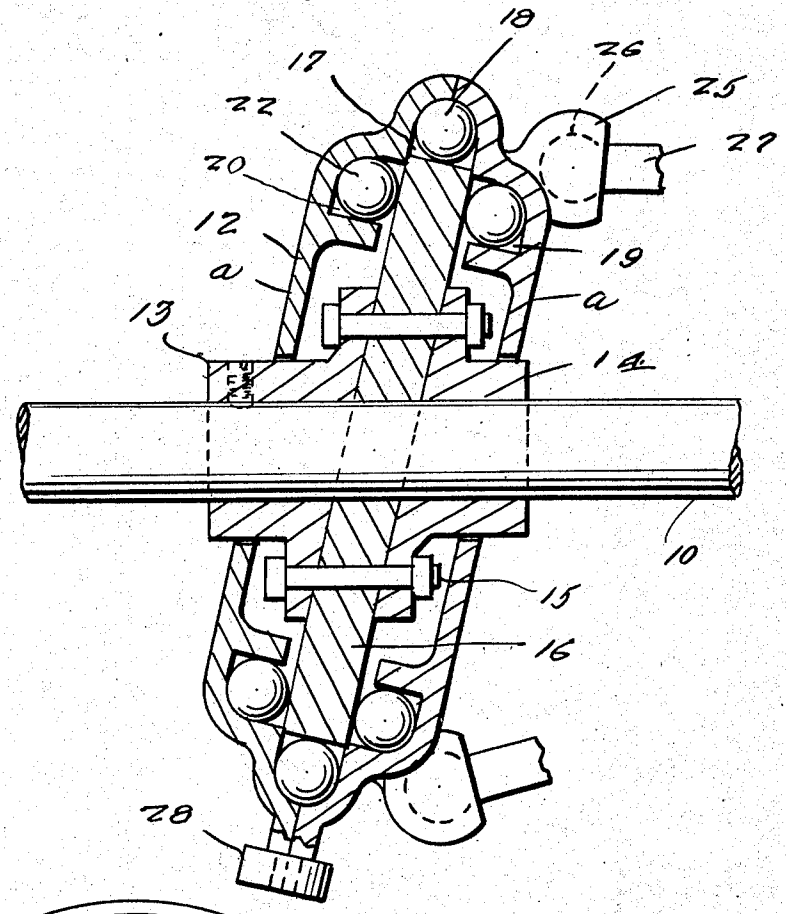
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MECHANICAL MOVEMENT

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Fig. 3.



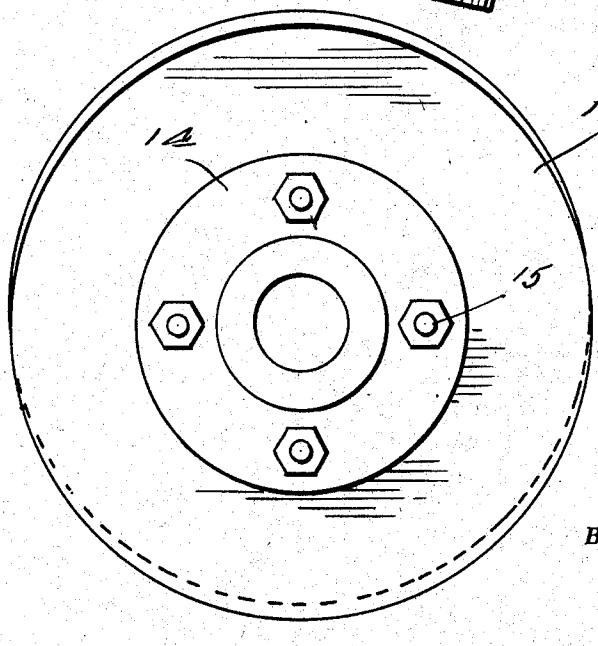


Fig. 5.

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UNITED STATES PATENT OFFICE

2,398,486

MECHANICAL MOVEMENT

Charles Herman Woods, Middletown, Conn.

Application January 11, 1944, Serial No. 517,826

3 Claims. (Cl. 74—60)

This invention relates to new and useful improvements in mechanical movements such as can be employed with steam, electric, internal combustion, and various other motive powers.

The principal object of the present invention is to provide a "swash" plate type of mechanical movement which will be smoother acting and less apt to incur difficulties than devices of this nature heretofore employed.

Other objects and advantages of the invention will become apparent to the reader of the following description.

In the drawings—

Figure 1 is a longitudinal sectional view of one embodiment of the present invention.

Figure 2 is a cross sectional view through the shaft and showing one side of one of the "swash" assemblies.

Figure 3 is a vertical sectional view taken substantially on the line 3—3 of Figure 2.

Figure 4 is a fragmentary inside elevational view of one of the sections of the raceway housing.

Figure 5 is a perspective view of the "swash" plate.

Referring to the drawings wherein like numerals designate like parts, it can be seen in Figure 1, that the present invention is employed in conjunction with pistons which, in turn, may be operated by steam, internal combustion, air or other media. In this connection numeral 5 denotes a cylinder block having cylinders 6 extending therethrough and in each cylinder are opposed pistons 7, 7.

At each end of the cylinder block 5 is a "swash" assembly case 8 in which the corresponding "swash" assembly generally referred to by numeral 9 is located.

A drive shaft 10 extends longitudinally through the cylinder block and cases 8 and has a power take-off pulley wheel 11 at one end thereof.

Each "swash" assembly 9 (see Figure 3) consists of a raceway housing 12, preferably constructed of side sections *a*, *a* and having openings therein, the axes of these openings being oblique to the true axes of the housing as is apparent in Figure 3 so that the housing will assume the position as shown in Figure 3.

Reference characters 13, 14 denote a pair of hubs which are flanged and bolted together as at 15 against opposite sides of an inclinedly set "swash" plate 16. The periphery of this plate 16 opposes a raceway 17 in the peripheral portion of the housing 12 where ball bearings 18 are located, while the opposite side portions of the "swash" plate adjacent its periphery oppose raceways 19, 20 in the sections *a*, *a* of the housing 12 wherein ball bearings 21, 22, respectively, are located. Thus it can be seen that efficient anti-frictional means is provided between the housing 12 and the "swash" plate 16.

As is apparent in Figures 1 and 2, the sections *a*, *a* of the housing 12 have lugs 23 which are bolted together as at 24.

Further, the innermost section *a* of each of the housings 12 has a plurality of sockets 25 thereon, corresponding in number to the number of cylinders 6 and into each of these sockets 25 is disposed the ball head 26 of a piston rod 27 which connects to the corresponding piston 7 as suggested in Figure 1.

The lowermost portion of each housing 12 carries a roller 28 which rides in arcuate tracks 29 on the bottom of the corresponding case 8 so as to preclude any possibility of the "swash" assembly rotating.

The action of the "swash" assembly 9 is typical of this form of movement. The pistons 7 that are about to act in their power stroke are at the moment in position of the corresponding "swash" assembly tilted with their portions nearest the cylinder block in closest proximity to the said pistons about to start their power stroke. In other words, there is a progressive tilting or wabbling of the "swash" assembly housing 12, and the "swash" plate 16 responding to this action drives the shaft 10.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

Having described the invention, what is claimed as new is:

1. In a mechanical movement comprising a shaft, an annular angularly disposed plate fixed to said shaft, a housing encompassing said plate, said housing having an annular anti-friction race about the periphery of said plate, opposed annular flanges confronting the opposite sides of said plate and forming with said housing an opposed pair of races, anti-friction members in each of said races and diametrically opposed operating means connected to said housing.

2. In a mechanical movement comprising a shaft, a pair of annular angularly disposed plates fixed to said shaft, a housing encompassing said plates, said housing having an annular anti-friction race about the periphery of said plate,

opposed annular flanges confronting the opposite sides of said plate and forming with said housing an opposed pair of races, anti-friction members in each of said races and diametrically opposed operating means connected to said housing.

3. In a mechanical movement comprising a shaft, an annular angularly disposed plate fixed to said shaft, a housing encompassing said plate, said housing having an annular anti-friction race about the periphery of said plate, opposed annular flanges confronting the opposite sides of said plate and forming with said housing an opposed pair of races, anti-friction members in each of said races and diametrically opposed operating means connected to said housing, diametrically disposed pairs of cylinders between said housing and oppositely movable pairs of pistons slidable in said cylinders and connected to said housing.

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