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PROVISIONAL SPECIFICATION.

**Improved Means for Converting Reciprocating Motion into Rotary Motion and Rotary Motion into Reciprocating Motion.**

I, FREDERICK LAMPLOUGH, of Albany Works, Cumberland Park, Willesden Junction, in the County of Middlesex, Managing Director, do hereby declare the nature of this invention to be as follows:—

5 The invention relates to that class of mechanism in which a ring surrounds the periphery of an inclined circular block fixed on a shaft and in which the ring is provided on its inner circumference with a pair of diametrically opposite conical rollers which fit within a tapered groove or recess around the periphery of the inclined block. This ring is provided with diametrically opposite trunnions which are mounted in suitable bearings.

10 The object of the present invention is to provide means for adjusting the conical rollers within the groove located in the periphery of the disc, and to reduce the friction caused by the rotation of the conical rollers.

15 Each of the axles of the conical rollers is mounted in a ball bearing fitted in a split socket carried by the rings and a ball thrust is arranged between the two rows of balls of each bearing.

Means for taking up the wear on the rollers are provided as follows:—

A screwed sleeve carrying the back ball race is screwed into the split socket and a distance piece is placed between said ball race and the thrust to force the latter with its conical roller forward.

20 In order to prevent the screwed sleeve from unscrewing in the split socket the latter on each side of the split, is provided with a lug and a screw or bolt is used to tighten the split socket around the sleeve.

Dated this 12th day of January, 1910.

25 HARRIS & MILLS,  
23, Southampton Buildings, London, W.C., and at  
Sheffield and Llanelly,  
Agents.

COMPLETE SPECIFICATION.

30 **Improved Means for Converting Reciprocating Motion into Rotary Motion and Rotary Motion into Reciprocating Motion.**

35 I, FREDERICK LAMPLOUGH, of Albany Works, Cumberland Park, Willesden Junction, in the County of Middlesex, Managing Director, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The invention relates to that type of mechanism in which a disc is set at an angle on a shaft and has a groove around its outer periphery in which are

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*Improved Means for Converting Reciprocating Motion into Rotary Motion, &c.*

located conical rollers carried by opposite sides of a yoke provided with trunnions.

If a reciprocating motion from connecting rods be transmitted to the yoke carrying the conical rollers a rotary motion is imparted to the disc and its shaft and if a rotary motion be imparted to the shaft a reciprocating motion will be imparted to the conical rollers and yoke and to parts connected therewith. 5

The object of the present invention is to provide means for adjusting the conical rollers within the groove located in the periphery of the disc and to reduce the friction caused by the rotation of the conical rollers. 10

The invention consists in the combination and arrangement of parts herein shown and described.

The invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a plan of the complete apparatus and

Figure 2 a front elevation, the inclined disc being omitted. 15

Figure 3 is a horizontal section on the line 3—3 of Figure 2.

$a$  is the shaft, and  $b$  is the inclined disc keyed thereon. In the periphery of the inclined disc is formed a groove  $b^1$  to receive the diametrically arranged conical rollers  $c$  each provided with an axle  $c^1$  carried by a yoke  $d$  which latter is provided with trunnions  $d^1$  at right angles to the axles  $c^1$ . 20

The trunnions  $d^1$  are mounted in suitable bearings  $d^2$  and the yoke  $d$  is oscillated on its trunnions. Connecting rods  $e$  give motion to the yoke  $d$  or receive motion therefrom and the yoke is of such dimensions that it may freely oscillate around the inclined disc  $b$ .

Each of the axles  $c^1$  of the conical rollers  $c$  is mounted in a ball bearing 25 having two rows of balls  $f$  and a ball thrust  $g$  between the two rows of balls  $f$  fitted within a split socket  $h$ .

Means for taking up the wear on the conical rollers  $c$  are provided as follows:—

A screwed sleeve  $i$  carrying the back ball race is screwed into each split socket  $h$  and a distance piece  $j$  is placed between said back ball-race and the ball thrust  $g$  to enable the latter to be moved forward and with it the second ball bearing which bears against the shoulder  $c^2$  of the roller  $c$ . 30

In order to prevent the screwed sleeve  $i$  from unscrewing in the split socket  $h$  the latter on each side of the split, is provided with a lug  $h^1$  and a screw or bolt  $h^2$  is used to tighten the split socket  $h$  around the sleeve  $i$ . 35

The connecting rods  $e$  will cause the yokes  $d$  to oscillate on their trunnions  $d^1$  thereby causing them by their conical rollers  $c$  pulling and pushing against the fixed inclined disc  $b$  to travel around the latter and consequently the cylinders and parts connected therewith giving motion to the connecting rods to travel around the fixed hollow shaft  $a$ . 40

If the cylinders and bearings  $d^2$  be fixed and the disc  $b$  and shaft  $a$  be rotatable these latter will be rotated by the reciprocating motion of the connecting rods  $e$ .

The arrangement of the cylinders, casing and eccentric form no part of the present invention. They are fully described in Specification No. 842 of 1910. 45

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In means for converting reciprocating motion into rotary motion and *vice versa*, the combination of a yoke, trunnions by which said yoke is carried, 50 means for rocking said yoke, a shaft, a disc fixed at an inclination on said shaft and within the yoke, a tapered groove in the periphery of said disc, ball bearings carried by the yoke, axles mounted in said ball bearings, and a conical roller carried by each of said last mentioned axles and acting within said groove, substantially as herein set forth. 55

2. Means for converting reciprocating motion into rotary motion and *vice*

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*Improved Means for Converting Reciprocating Motion into Rotary Motion, &c.*

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5 *versa* as in Claim 1, having two rows of balls in the ball bearing for the axles of the conical rollers, a ball thrust bearing between the two rows of balls, a split socket enclosing the two rows of balls and ball thrust bearing, and means for gripping the socket around the ball bearings, substantially as herein set forth.

10 3. Means for converting reciprocating motion into rotary motion and *vice versa* as in Claims 1 and 2 having a screwed sleeve carrying the back ball race and screwed into the split socket and a distance piece placed between said back ball race and the ball thrust to enable the latter to be forced forward for taking up the wear on the conical rollers, substantially as herein set forth.

4. The improved means for converting reciprocating motion into rotary motion and *vice versa* constructed substantially as herein described and as represented in the accompanying drawings.

Dated this 12th day of July, 1910.

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HARRIS & MILLS,  
Agents.

Fig. 1

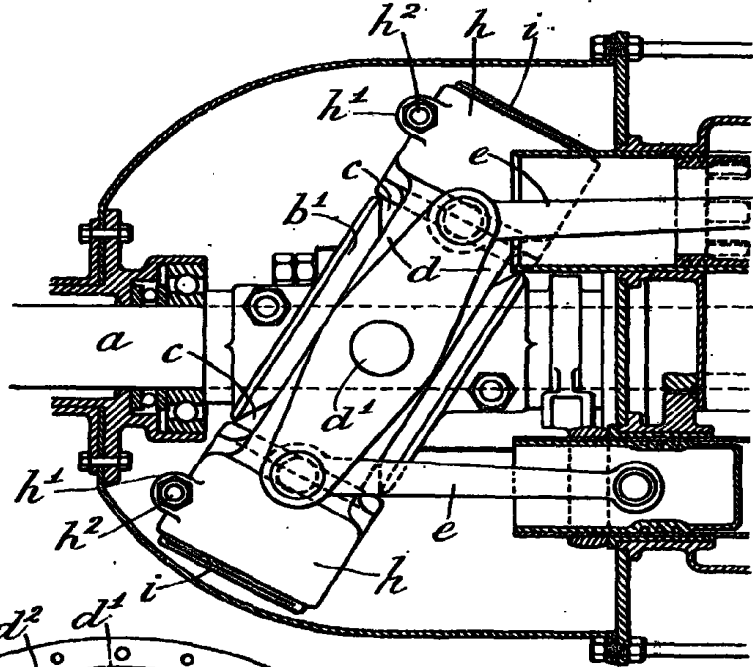


Fig. 2

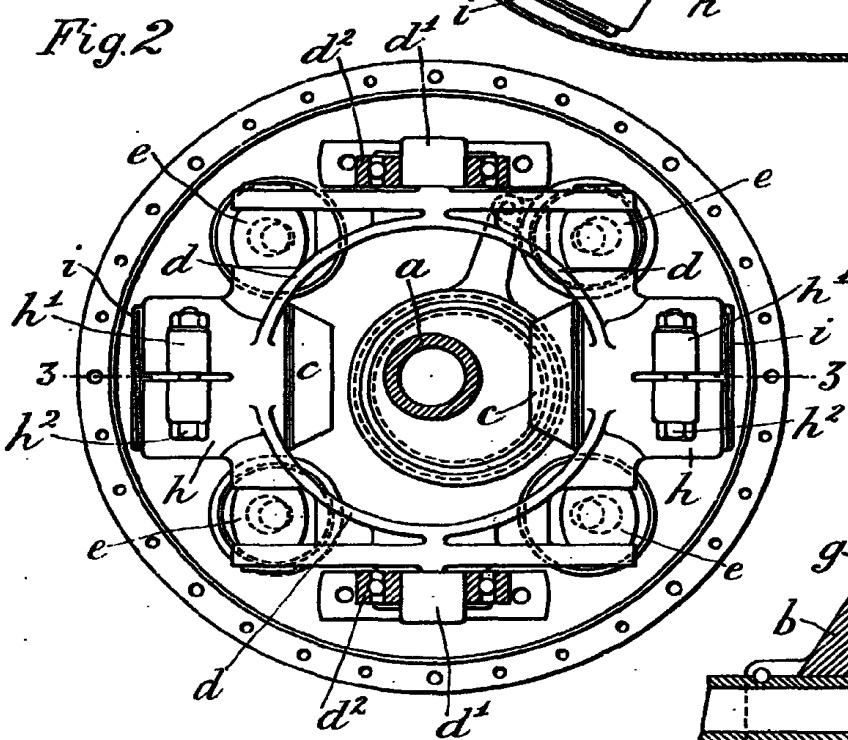
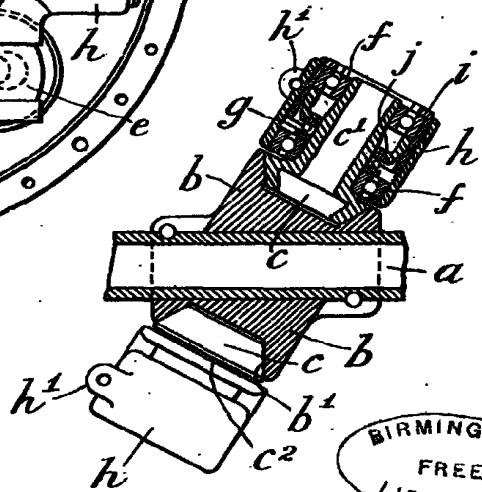


Fig. 3



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[This Drawing is a reproduction of the Original on a reduced scale.]