

No. 707,593.

Patented Aug. 26, 1902.

F. W. JONES.  
CLUTCH.

(Application filed Aug. 13, 1900.)

(No Model.)

2 Sheets—Sheet I.

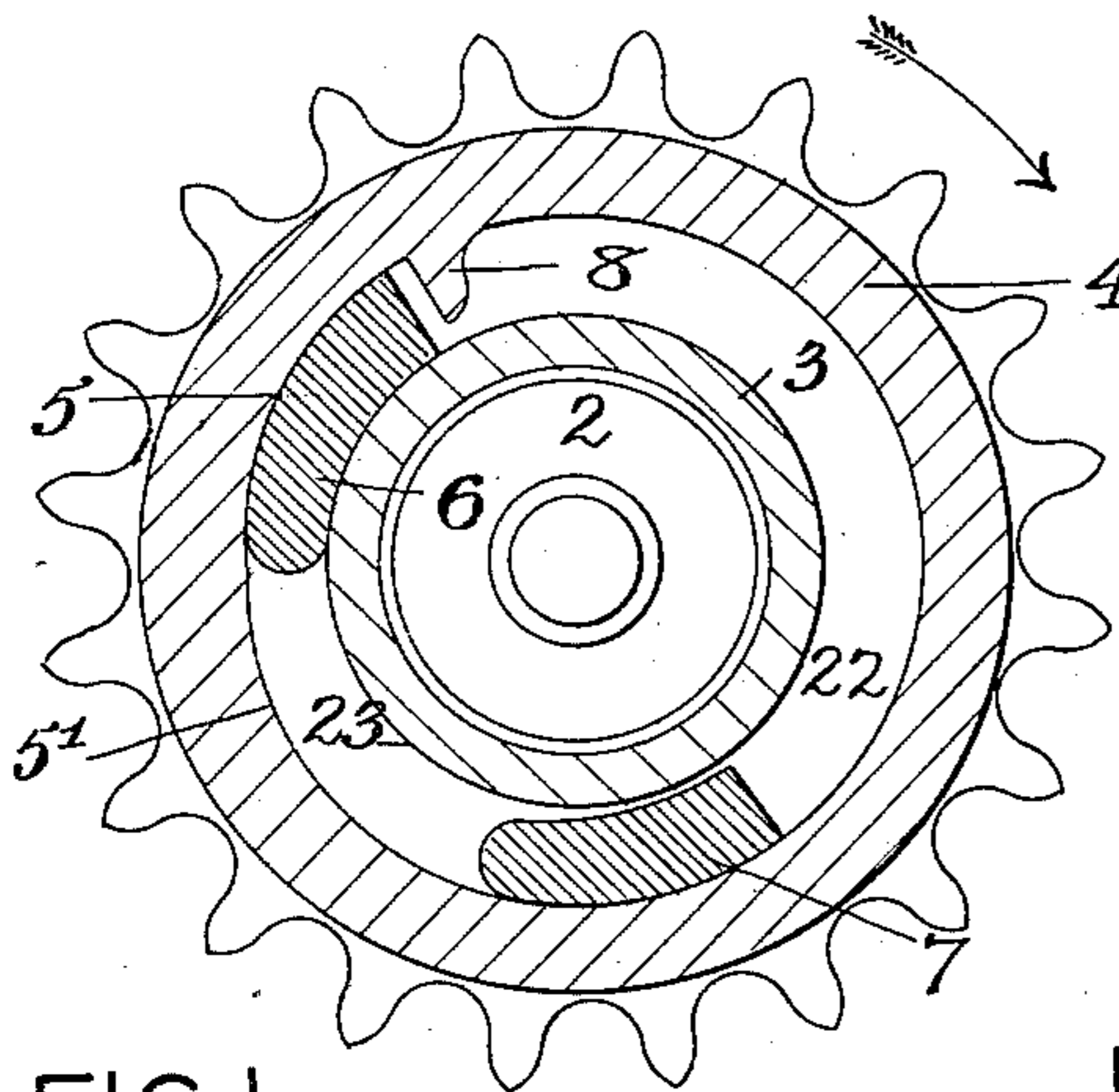


FIG. I.

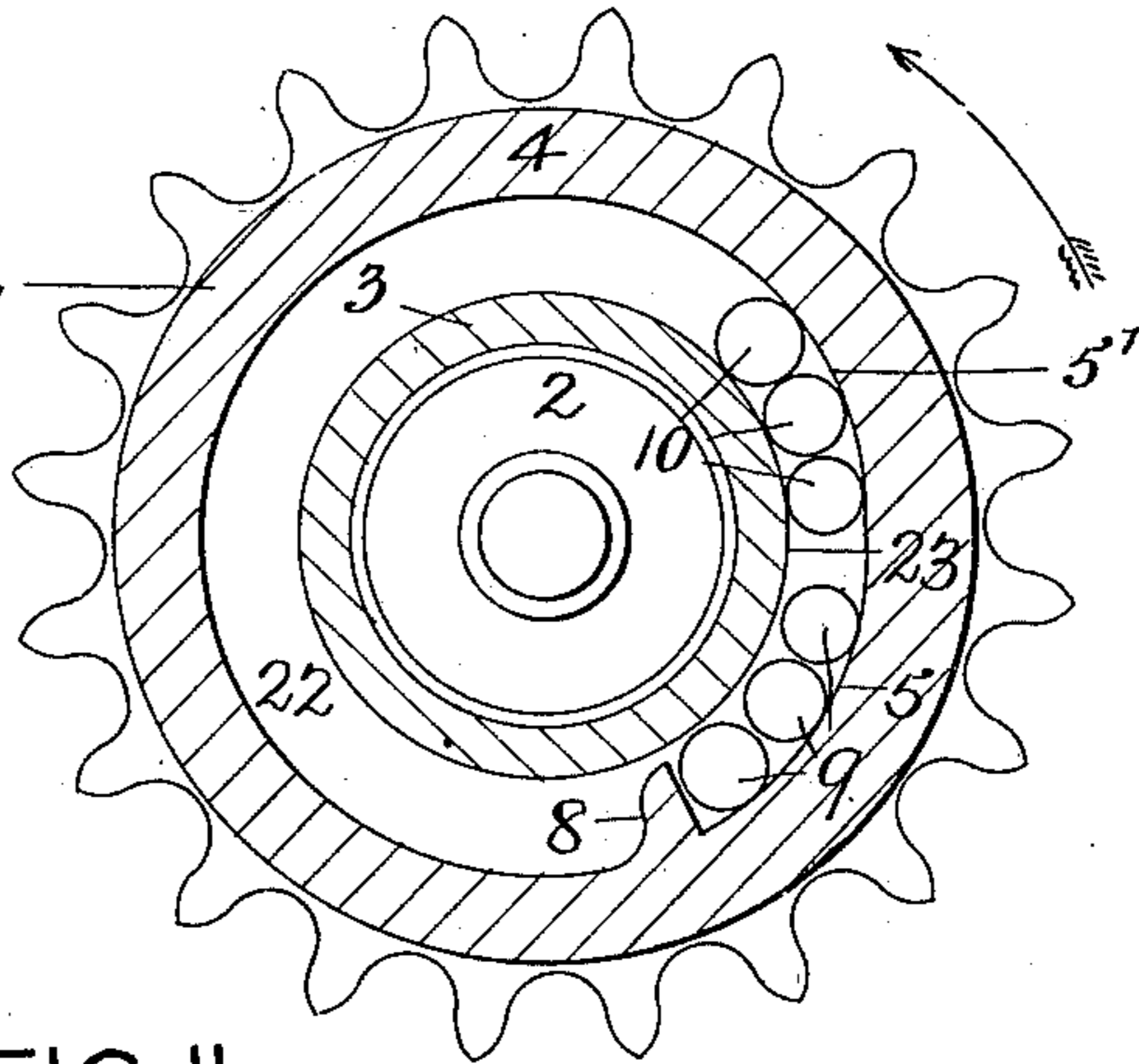


FIG. II.

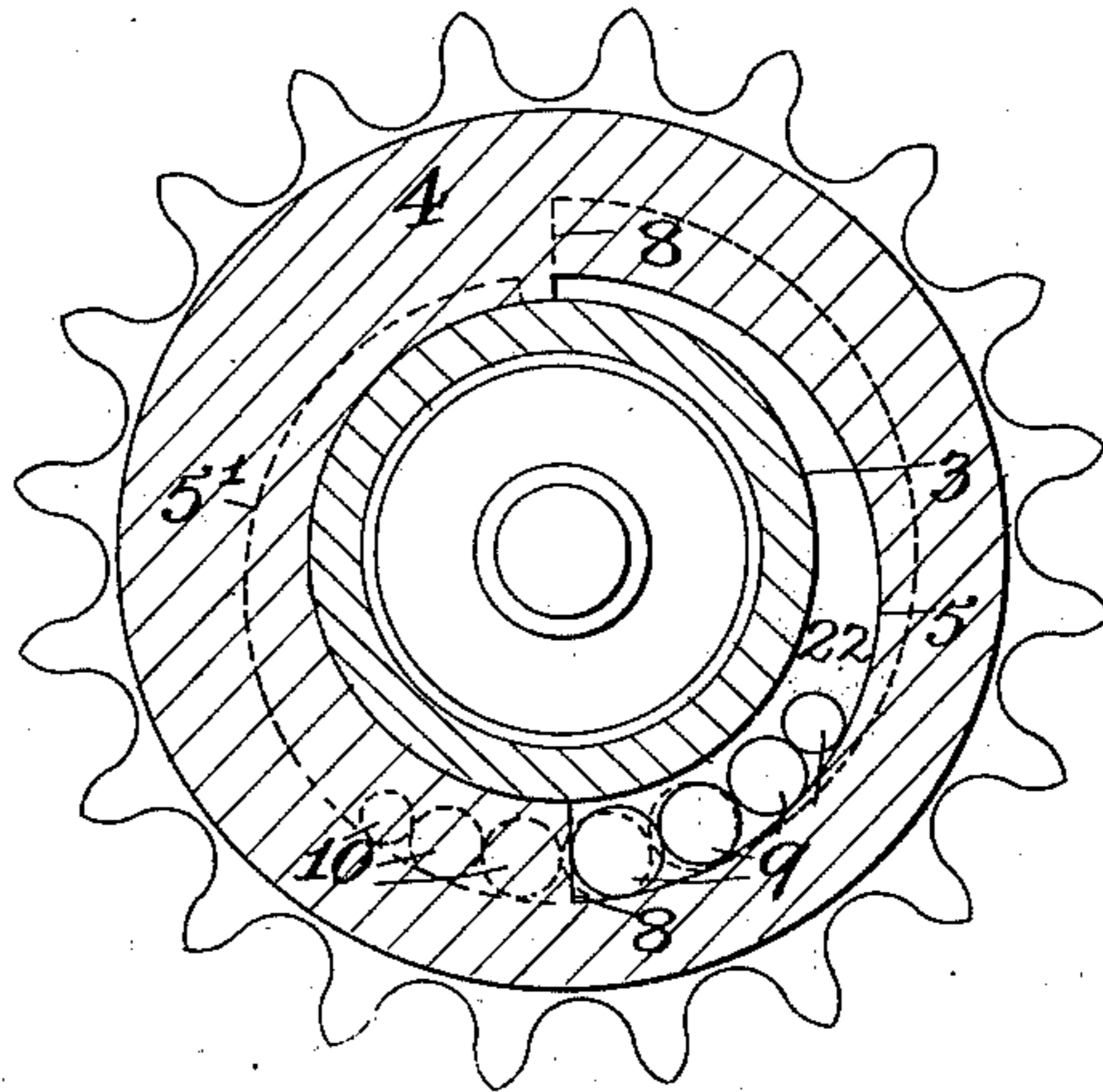


FIG. III.

Witnesses,

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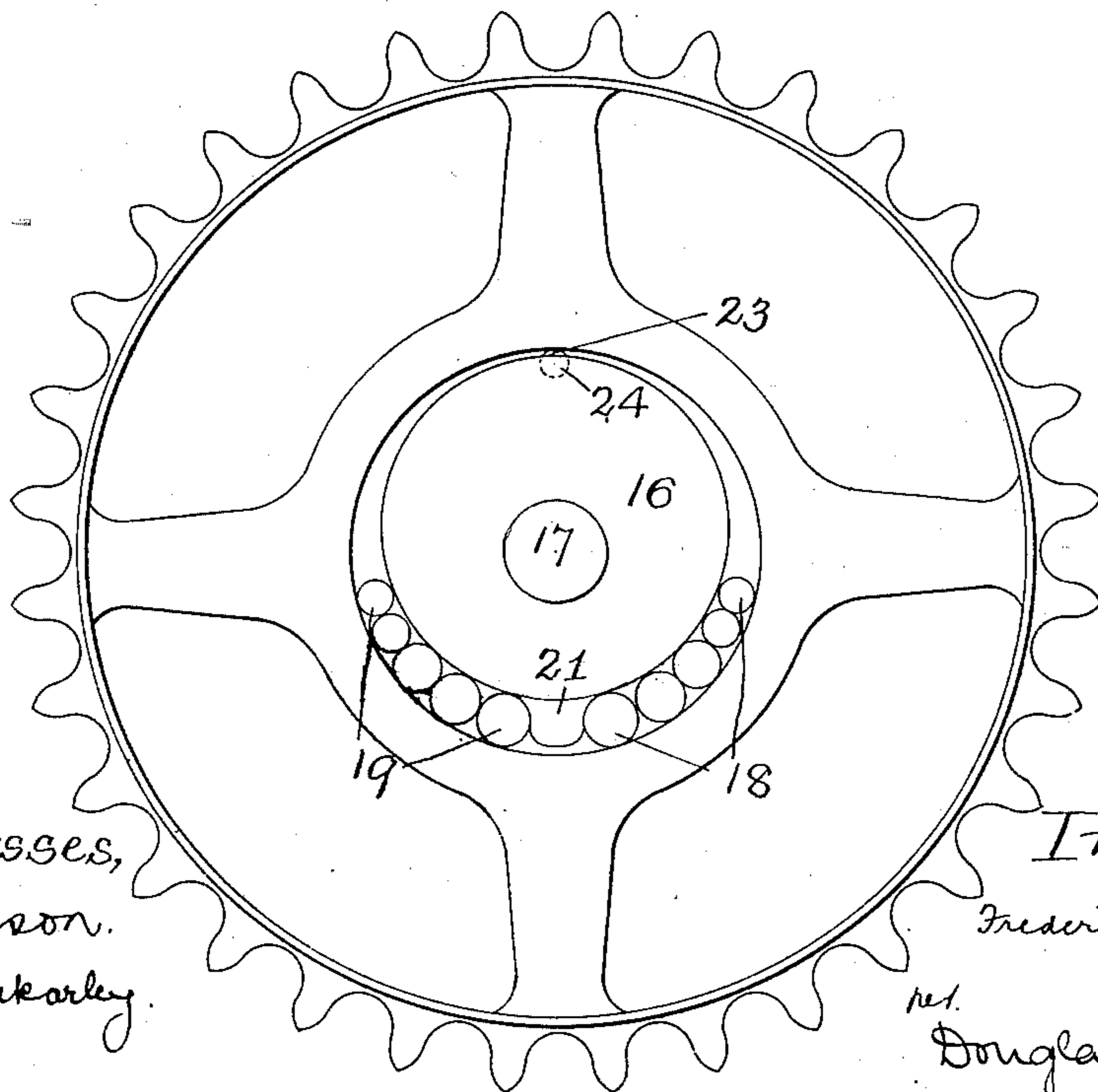
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2 Sheets—Sheet 2.

FIG. IV.



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# UNITED STATES PATENT OFFICE.

FREDERICK WARNER JONES, OF LONDON, ENGLAND.

## CLUTCH.

SPECIFICATION forming part of Letters Patent No. 707,593, dated August 26, 1902.

Application filed August 13, 1900. Serial No. 26,721. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK WARNER JONES, a subject of the Queen of Great Britain, residing at London, in the county of Middlesex, England, have invented certain new and useful Improvements in Clutches, of which the following is a specification.

My invention relates to clutches suitable for bicycles, and has for its principal object to provide means whereby the rider may pedal forward, "free-wheel," or back pedal, as he may desire; and my invention consists, essentially, in a clutch comprising an inner part and an outer part, one of such parts having a concentric surface and the other part having a double eccentric surface and one or more blocks, balls, or rollers introduced between the said surfaces and adapted to engage therewith or disengage therefrom, according as certain relative movements or tendencies to move are imparted to either the said inner or the said outer part, and in order that my invention may be properly understood I will describe the same with the aid of the accompanying drawings, wherein—

Figures I to III are side elevations, with the clutch mechanism disclosed, of three embodiments of my invention as applied to the hub-sprockets of rear-driving safety-bicycles. Fig. IV shows a modified construction suitable for application to the crank-sprockets of rear-driving safety-bicycles.

The same numerals indicate the same parts throughout the drawings.

Referring to Fig. I, I provide the hub end 2 with a concentric collar or other suitable surface 3, and I form on the sprocket-ring 4 a double eccentric surface 5 5'. Between the surfaces 3 and 5 5' I introduce two blocks 6 7 of correspondingly-curved taper form. I provide a stop 8, which prevents the block 6 moving far back from its gripping position; but the block 7 is generally free to move in any part of the circle except that about the block 6. When motion is imparted to the sprocket-ring in the direction of the arrow, the block 6 is immediately seized between the surfaces 5 and 3, and motion is transmitted to the hub and wheel. Directly the rider ceases active forward pedaling the surface 3 travels forward relatively to the ring 4, and the block 6 is released and driven toward the

stop 8. The parts being now disengaged, the ring 4 remains stationary and the rider free-wheels or "coasts." Meanwhile the block 7 55 has remained free, alternately being pushed up the back part of the circle by the stop 8 and then falling away from it forward down the front part; but on the rider back pedaling the eccentric surface 5' engages with the block 60 7 and jams it against the surface 3, so that the ring 4 is again engaged with the hub and will remain so as long as the rider back pedals.

The back-pedaling position is shown in Fig. II, where two graduated series of balls or 65 rollers 9 10 are substituted for the blocks 6 7. Fig. I shows the forward-pedaling position.

Fig. III shows a further detail modification, the eccentric surfaces 5 5' being formed in 70 different planes. In this case I prefer, if width is of consequence, to use rollers or disks 9 10 rather than balls.

In applying my invention to the crank-sprocket 15 the parts are inverted, the boss 16, Fig. IV, carried directly or indirectly by 75 the crank-axle 17, is provided with the double eccentric surface 20 20', and the concentric surface 25 is formed on the sprocket 15. A series of rollers or balls 18 19, graduated off in both directions, is introduced between the 80 two surfaces. On forward pedaling the balls 18 will grip between the surfaces 25 20 and on back pedaling the balls 19 will grip between the surfaces 25 20'; but if the rider holds the parts in the position shown (which 85 may correspond to, say, left pedal down) then the balls 18 19 will all gravitate to the position shown and no gripping will take place. A stop 21 is introduced between the two sets of balls 18 19. In Fig. IV, I have shown the 90 balls 18 19 acting also as bearing-balls and a single central ball 23, working in a socket 24, to maintain the suitable lateral covers and grooves.

My invention may be applied to other suitable parts of mechanical vehicles, substantially as above described, modifications being made to suit special circumstances, as may be required. 95

What I claim, and desire to secure by Letters Patent of the United States, is— 100

In a clutch, the combination of a driving part, a driven part, a concentric surface of the driven part, a double eccentric surface

on the driving part, a taper intermediate gripping-piece adapted to engage in one direction, a taper intermediate gripping-piece adapted to engage in the other direction, and  
5 a stop on the driving part dividing the double eccentric surface, the said stop being located between the larger ends of the two taper

gripping-pieces, substantially as and for the purpose set forth.

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Witnesses:

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