No. 832,383. PATENTED OCT. 2, 1906.

C. G. HERBERT.

CLUTCH.

APPLICATION FILED DEC. 31, 1904.

3 SHEETS—SHEET 1.

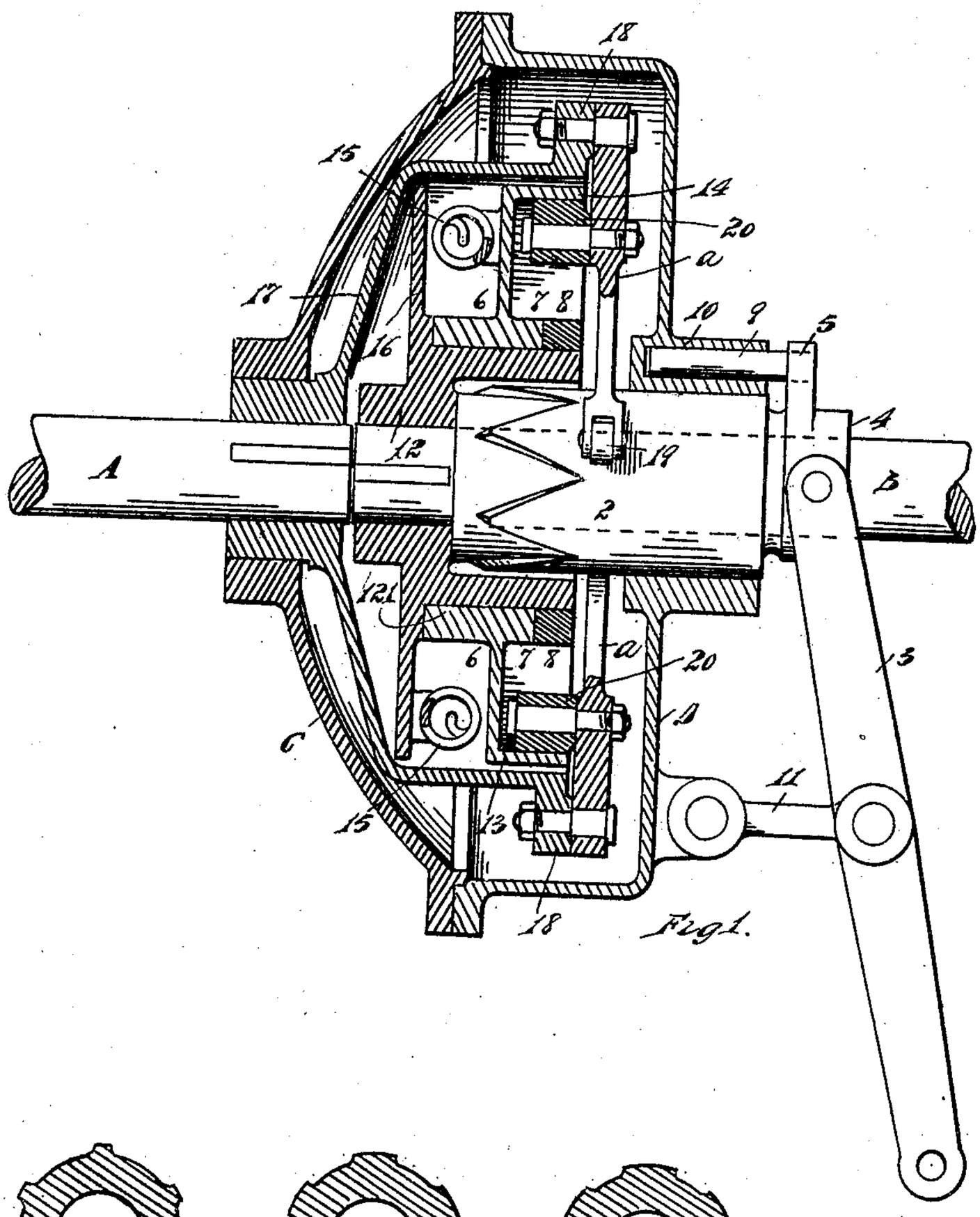

Fig 1.

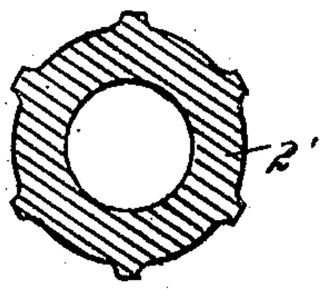

Fig 6.

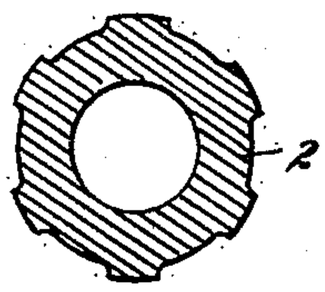

Fig 7.

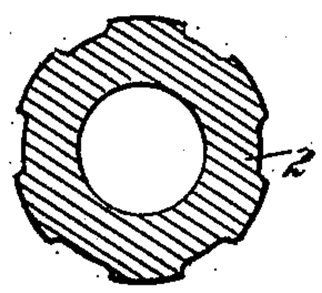

Fig 8.

WITNESSES

J. F. Massey

H. M. Swan

INVENTOR

Charles G. Herbert.

By

Porter & Burton Attorneys.

No. 832,383. PATENTED OCT. 2, 1906.

C. G. HERBERT.

CLUTCH.

APPLICATION FILED DEC. 31, 1904.

3 SHEETS—SHEET 2.

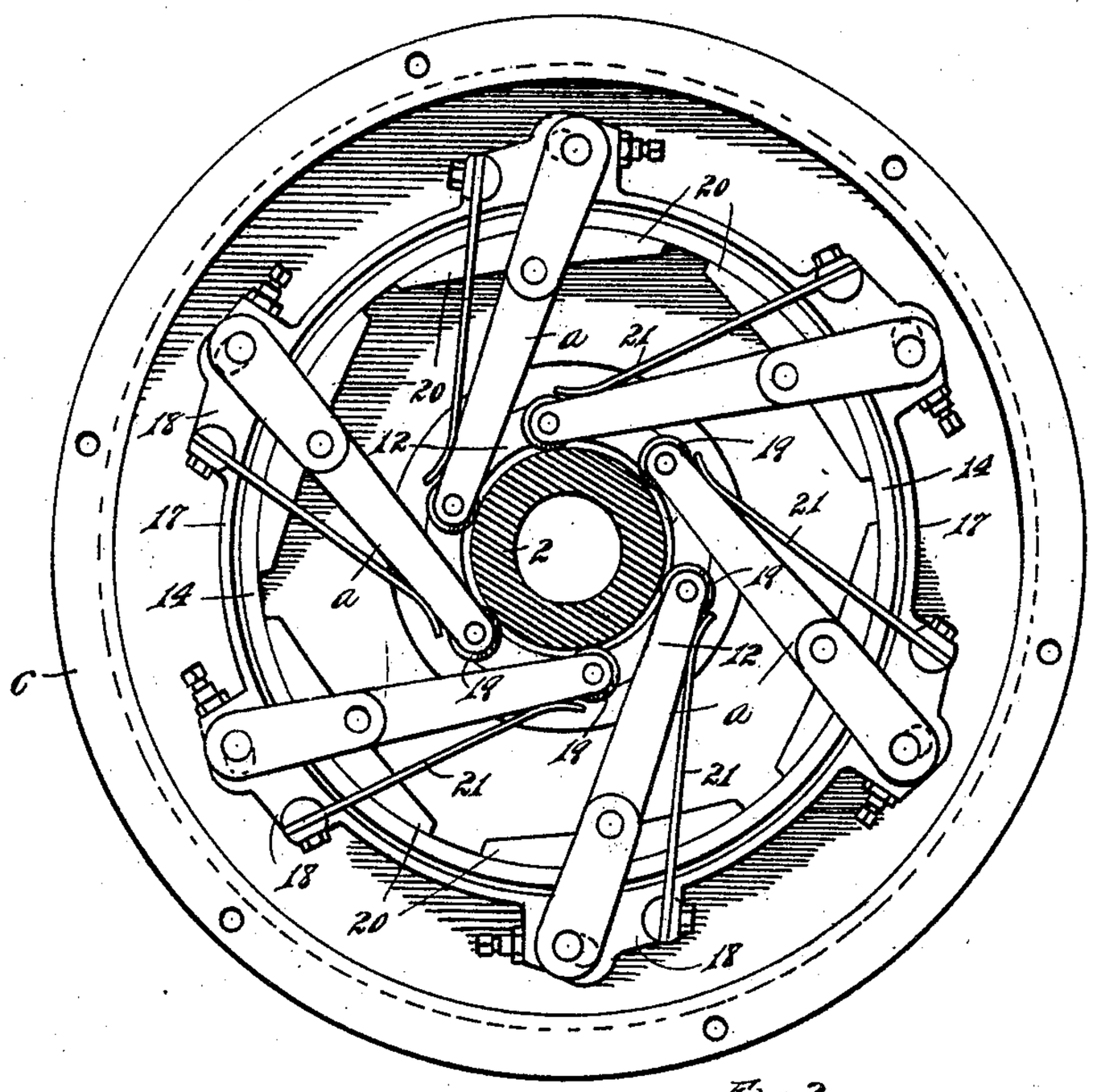

Fig 2.

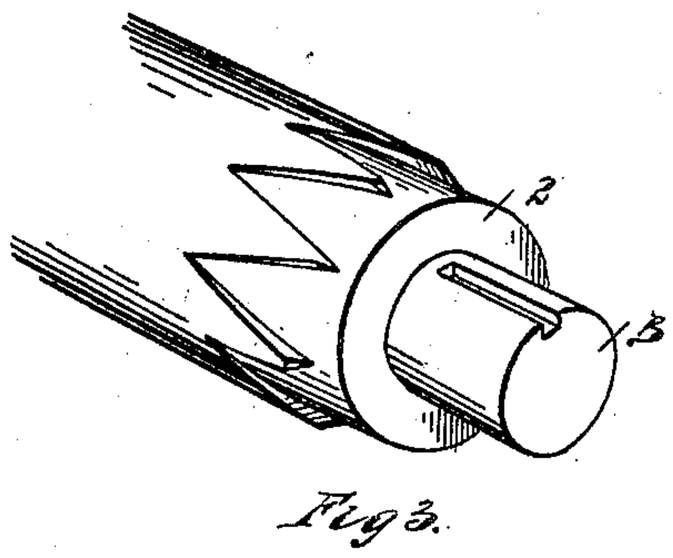

Fig 3.

WITNESSES

T. D. Massey

H. M. Swan

INVENTOR

Charles G. Herbert.

By Parker & Burton Attorneys.

No. 832,383.

PATENTED OCT. 2, 1906.

C. G. HERBERT.

CLUTCH.

APPLICATION FILED DEC. 31, 1904.

3 SHEETS—SHEET 3.

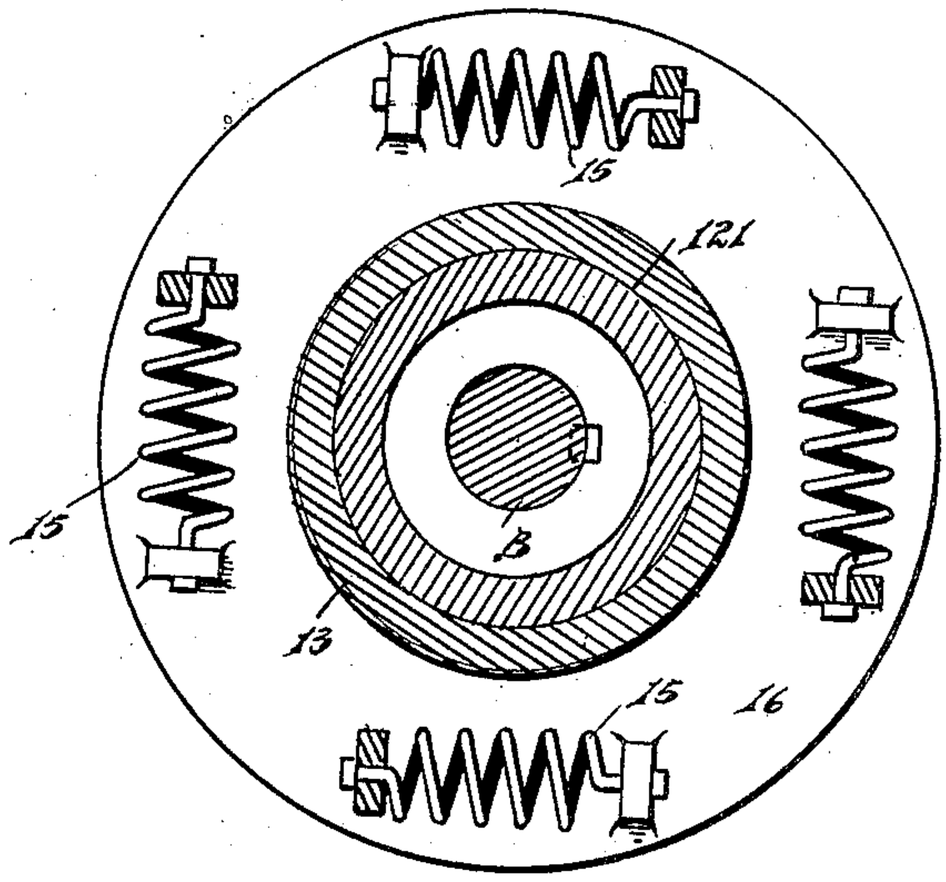

Fig 4.

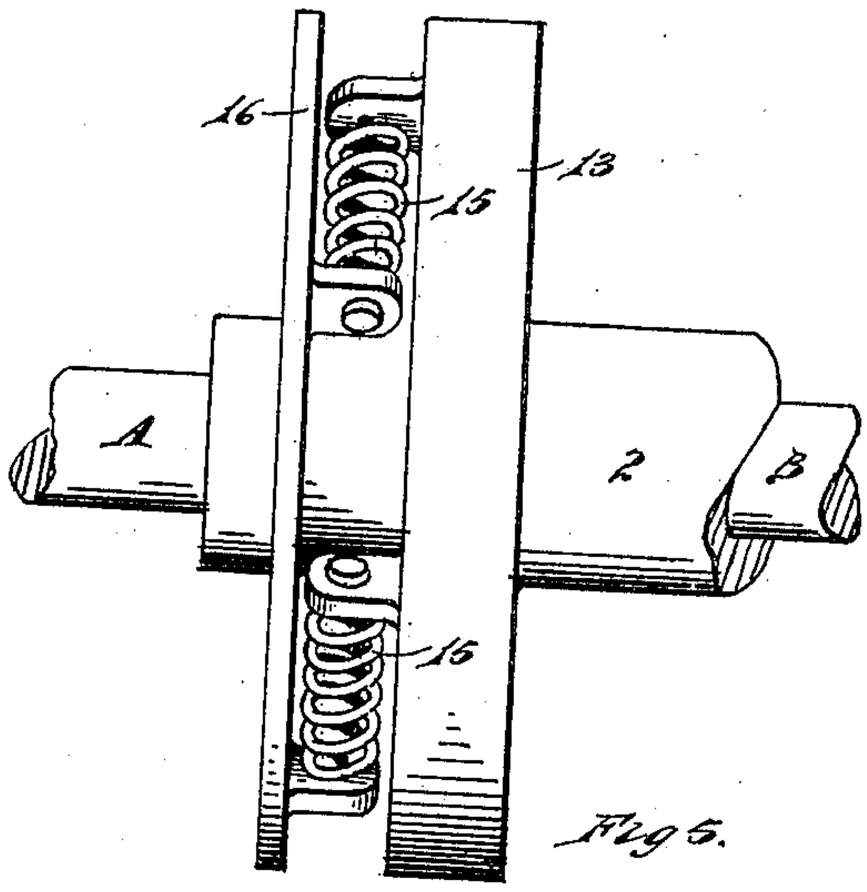

Fig 5.

WITNESSES

T. Brassey

H. M. Swan

INVENTOR

Charles G. Herbert.

By Parker & Burton Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES G. HERBERT, OF DETROIT, MICHIGAN.

CLUTCH.

No. 832,383. Specification of Letters Patent. Patented Oct. 2, 1906.

Application filed December 31, 1904. Serial No. 239,106.

To all whom it may concern:

Be it known that I, CHARLES G. HERBERT, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Clutches; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to clutches.

It has for its object an improved variable-speed clutch adapted to be used to connect a driving and a driven shaft where it is desired to produce different speeds of revolution of the two shafts.

In the drawings, Figure 1 is a section longitudinal of the two shafts and through the clutch mechanism. Fig. 2 is an elevation of the clutch mechanism. Fig. 3 is a perspective of the cam which actuates the clutch-arms. Fig. 4 is an elevation of one of the cushioning-disks. Fig. 5 is a side elevation of the cushioning device. Figs. 6, 7, and 8 are cross-sections of the hub at the lines 6 6, 7 7, and 8 8 of Fig. 1.

The two shafts A and B, one of which is the driver and the other the driven shaft, are in axial alinement, with their ends abutting or brought closely together and with their ends inclosed in a case C D, which may, if desired, be an oil-containing case. Through the part of the case D which surrounds the end of the shaft B is a cam 2, adapted to have a sliding movement along the shaft B in the direction of the axis thereof. The sliding movement is produced by the actuating-lever 3, the fork of which is pivoted to a flange 4 on the cam. The flange 4 is provided with an extension 5, that holds a steady-pin 9. The pin engages through a guide-hole 10 in the hub of the casing D. The lever 3 is pivoted on an oscillating strut 11, held to the case.

Within the case and keyed to the end of the shaft B is a head 12, provided with a disk 16 and a bearing-journal on which is journaled a clutch-plate 13, provided with a cylindrical clutch-ring 14. The clutch-disk 13 is cushioned to the head 12 by springs 15, that are interposed between lugs on the plate 13 and lugs on the disk 16 of the head 12.

On the end of the shaft A is keyed a shoe-carrier 17, which is cup-shaped and receives within the cavity of the cup the head 12 and the plate 13. At the rim of the cup are ears 18, to which are pivotally secured levers *a*, that reach inward toward the cam 2. Each lever carries at its inner extremity an antifriction-roller 19, that travels on the cam 2, tangent thereto, and each lever carries intermediate its extremities and pivotally connected to it a clutch-shoe 20, that is adapted to be brought into clutching engagement with the inner face of the clutch-flange 13, and such engagement is produced by swinging the end 19 of the lever 18 away from the shaft B. Normally each lever is held strained toward the shaft B by a spring 21, held in the ear 18 and bearing against the side of the lever. The hub 2 is provided on its inner end with an undulating or a corrugated surface, with the depressions of the undulations or corrugations increasing in width toward that end of the hub which lies toward the shaft A.

In operation the shaft B revolving carries with it the head 12 and the clutch-plate. The shaft A carries with it the cup 17 and the levers and the shoes which engage the clutch-ring 14. The cam 2 is reciprocated under the hanging ends of the levers and either releases the clutch by allowing the hanging ends to drop into depressions in the hub or completes the clutch by forcing the ends of the levers out over the high points. During the periods that the antifriction-wheel is traveling in the depression in the hub the shoes are out of clutch and the one shaft does not act upon the other. During the periods when the ends of the levers are traveling over the high parts of the hub the shoes are in clutch with the ring and one shaft acts on the other. In the operation of the device there is a constant succession of alternate periods of clutch and slip, varying between the time of constant clutch, when the parts are in the position shown in Fig. 2, to a position of constant slip, when the cam is drawn entirely out, and the duration of the period of clutch and of the period of slip varies with the position of the cam. It is apparent that there may be between the two periods of full clutch and full slip an infinite variation.

The cushion-springs interposed in the device break the abruptness of transit from the periods of clutch to the period of slip.

What I claim is—

1. A clutch, having in combination with a driving-shaft and a driven shaft, a hollow rim provided with a friction-surface carried by the driven shaft, shoe members adapted

to engage the same, a plurality of levers pivotally attached to the driving-shaft, each one of said levers being also pivoted to one of said shoe members, and means adapted to be manually moved into a position of tangential contact with said levers for causing said shoes to intermittently contact the friction-surface of said rim, substantially as described.

2. In a friction-clutch, in combination with a driving-shaft and a head keyed thereto, a driven shaft, a hollow rim provided with a friction-surface connected therewith, a plurality of friction-shoes pivotally connected to said head, and means for causing said shoes to engage said friction-surface alternately with periods of non-engagement therewith, substantially as described.

3. In a friction-clutch, in combination with a hollow rim provided with an interior friction-surface, shoes adapted to engage the same, lever-arms carrying said shoes, a revoluble actuator concentric with respect to said hollow rim and arranged to be tangentially contacted by the free ends of said lever-arms, and having means to produce a regularly-alternating centrifugal and centripetal motion thereof with respect to itself, said means being capable of varying the relative duration and nature of each complete phase of such movements, substantially as described.

4. In a friction-clutch, in combination with a hollow rim clutch-surface, shoes adapted to clutch the hollow rim lever-arms whereby the same may be actuated, a movable lever-actuator provided with high and low parts alternating, adapted to produce a regular alternating swing thereof, substantially as described.

5. In a friction-clutch, in combination with a hollow rim clutch-surface, shoe members adapted to clutch the hollow rim, a movable shoe-actuator provided with high and low parts alternating with the high parts gradually increasing in width, and the low parts gradually decreasing in width toward one end of the movable actuator, substantially as described.

6. In a friction-clutch, in combination with a hollow rim clutch-surface, shoes adapted to clutch the hollow rim lever-arms whereon said shoes are mounted, a movable lever-actuator provided with alternating high and low parts, and with a high zone, substantially as described.

7. In a friction-clutch, in combination with a driving-shaft and a driven shaft, a hollow rim provided with an inwardly-facing friction-surface connected with one of said shafts, a head keyed to the other of said shafts, a plurality of shoes carried by said head and adapted to engage said friction-surface, and means carried by said driving-shaft for causing said shoes to automatically and alternately engage and be released from engagement with said friction-surface, substantially as described.

8. A clutch for imparting motion from a driving to a driven shaft, having in combination a hollow rim provided with a friction-surface, shoe members adapted to engage the same, a plurality of levers pivotally attached to the body portion of the clutch, each one of said levers being also pivoted to one of said shoe members, and means to engage said levers and cause a plurality of oscillations thereof at each revolution of the body portion, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

CHARLES G. HERBERT.

Witnesses:

CHARLES F. BURTON,

MAY E. KOTT.