

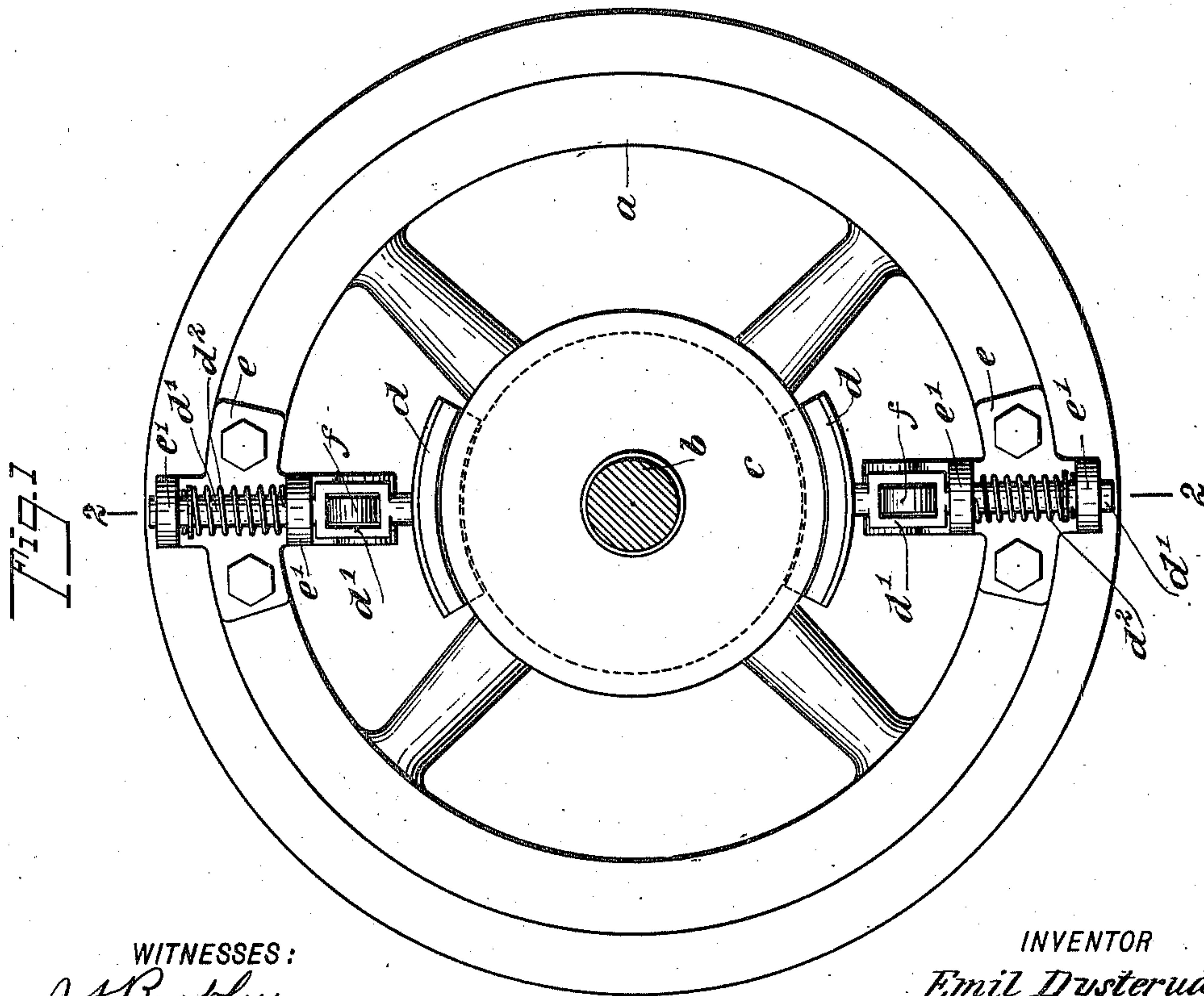
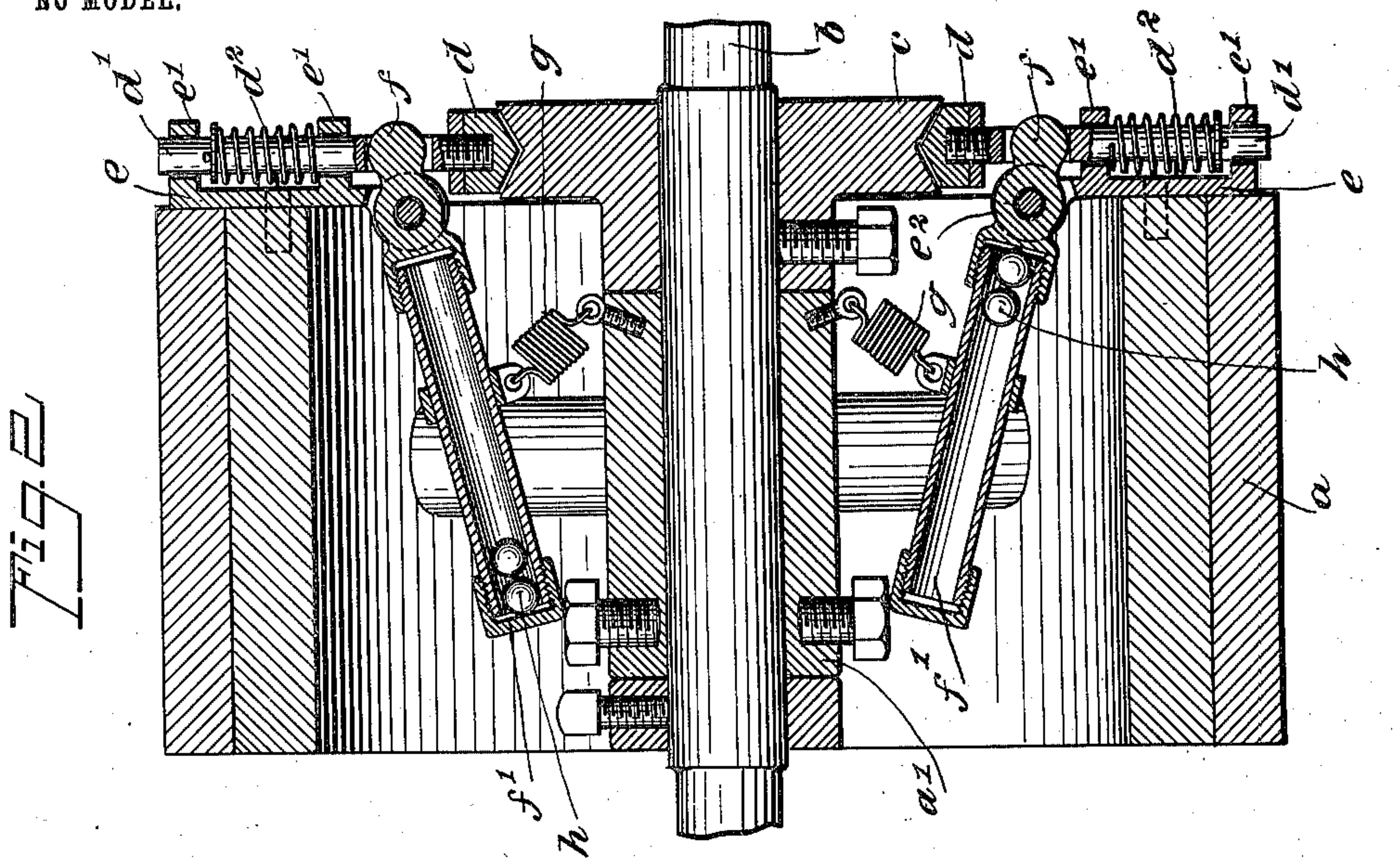
No. 723,196.

PATENTED MAR. 17, 1903.

E. DYSTERUD.  
CLUTCH.

APPLICATION FILED APR. 23, 1902.

NO MODEL.



**WITNESSES:**

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# UNITED STATES PATENT OFFICE.

EMIL DYSTERUD, OF MONTEREY, MEXICO

## CLUTCH.

SPECIFICATION forming part of Letters Patent No. 723,196, dated March 17, 1903.

Application filed April 23, 1902. Serial No. 104,292. (No model)

*To all whom it may concern:*

Be it known that I, EMIL DYSTERUD, a citizen of the United States, and a resident of Monterey, in the State of Nuevo Leon, Mexico, have invented a new and Improved Clutch, of which the following is a full, clear, and exact description.

This invention relates to a centrifugal clutch designed especially for use in connection with alternating-current electric motors or loose pulleys, by which means the motor is not coupled with its load until the full speed of the motor or pulley has been attained. An example of a clutch thus applied may be seen in the patent to Thompson, No. 664,190, dated December 18, 1900. In this patent centrifugal arms actuate the clutch, and these arms are held inactive by a spring. The arms are of constant weight, and as the rotary part of the motor moves (to which part the arms are attached) the arms swing out gradually as the speed of the rotary part increases, and the clutch is thus gradually applied and the motor gradually connected with its load. The result is that part of the load is applied to the motor before its full speed is attained and the very object of the device is to that extent defeated.

The prime object of my present invention is to hold the clutch completely off until the full speed of the motor is attained and then instantly to begin the application of the clutch and connect the motor with its load. Therefore my invention resides in a centrifugally-actuated controller for automatically allowing the centrifugally-actuated parts of the centrifugal clutch to become active when a certain speed has been attained. This is done by affecting the parts either positively or negatively—that is, either by increasing the heft of the centrifugally-actuated parts or removing a restraining load from such parts—so that when a certain speed is reached said parts will move outward much more rapidly, and thus instantly begin the application of the clutch. By this device the motor is free to turn unrestrained by its load during the entire period of starting and no part of the load is applied until the full speed has been very nearly attained, at which period, owing to the above-explained change in the condition of

the centrifugally-actuated parts, the clutch is instantly fully applied.

This specification is a description of one form of my invention—namely, a form in which the controller acts at a certain period positively to increase the heft of the centrifugally-actuated parts—while the claims are definitions of the actual scope of the invention.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both views.

Figure 1 is a face view of the invention, and Fig. 2 is a section on the line 2 2 of Fig. 1. *a* indicates the rotary driving part, the hub *a'* whereof is mounted loosely on the rotary driven part *b*.

*c* indicates a clutch-disk fast to the driven part or shaft *b*, and *d* indicates clutch-shoes working peripherally on the disk *c*.

Fastened to the driving part *a* are face-plates *e*, which have lugs *e'*, wherein are mounted the stems *d'* of the shoes *d*, and *d<sup>2</sup>* indicates springs pressing these shoes lightly away from the driven member *b*. Fulcrumed between lugs *e<sup>2</sup>* on the face-plates *e* are centrifugally-actuated levers, each comprising a stud or short arm *f*, engaged with the adjacent stem *d'*, and long arms *f'* in the form of tubes closed at each end, as shown.

*g* indicates springs acting between the hollow arms *f'* and the hub *a'* to hold the arms normally in the position shown in Fig. 2, in which position the shoes *d* are disengaged from the disk *c* and the driving member *a* is free to turn on the shaft *b*. The hollow arms *f'* contain the before-mentioned clutch-controlling means in the form of a shifting weight, which may be and preferably is the balls *h*, which may be made of any convenient heavy material, but may be replaced, if desired, by metallic mercury, giving more weight with the same space.

Referring to Fig. 2, it will be observed that when the parts are in the idle position shown the controller-weights *h* in the upper tubular arm *f'* are rolled down to the free end thereof and in the lower arm are rolled down adjacent to the fulcrum end thereof. When the part *a* turns slowly, the balls *h* will constantly change position in the arms *f'*, ac-



according to the position of the arms—that is, when either one of the two arms is above the shaft *a* the balls *h* will move toward the free end and when below the shaft toward the fulcrum. When, however, a certain speed is reached, the balls *h* will move under centrifugal force to the ends of the arms next to their fulcrums. This position will be maintained until the speed of the part *a* becomes so great that the arms *f'* move outward beyond parallelism with the shaft *b* and then all of the balls *h* are immediately thrown into the free ends of the arms *f'*, and thus the heft of the arms is increased, and they are therefore occasioned to move out much more rapidly.

In the application of this construction to an electric motor, as explained hereinbefore, the parts should be so adjusted that the instant before the motor reaches its full speed the arms *f'* will assume exact parallelism with the shaft *b*, but the shoes *d* will not yet be engaged with the disk *c*. This condition having arrived, as the speed of the part *a* increases and actually attains its high speed the arms *f'* will move slightly farther and then all of the balls will rush to the free ends of the arms, thus instantly increasing the heft of the arms and instantly applying the shoes *d* to the disk *c*, which operation fixes the parts *a* and *b*, or, in other words, connects the motor with its load.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of a rotary driving part, a part to be driven therefrom, a centrifugal clutch for connecting the two, said clutch including a hollow arm, and a weight mounted in said arm to move freely therein in direction longitudinally of the arm.

2. The combination of a rotary driving part, a part to be driven therefrom, a centrifugal clutch for connecting the two, said clutch including a hollow arm and a weight movably mounted in said arm, and means for yieldingly holding the arm in inactive position.

3. The combination of a shaft, a driving member arranged to turn loosely around the axis thereof, a face-plate attached to the driving member, a stem carried to slide in the driving member, a shoe held by the stem, a clutch-disk fastened to the shaft and adapted to be engaged by the shoe, a centrifugally-actuated lever connected with the stem at

one arm, a weight movably carried by the other arm, and means for yieldingly holding said lever in inactive position.

4. The combination of a shaft, a driving member arranged to turn loosely around the axis thereof, a face-plate attached to the driving member, a stem carried to slide in the driving member, a shoe held by the stem, a clutch-disk fastened to the shaft and adapted to be engaged by the shoe, a centrifugally-actuated lever connected with the stem at one arm, a weight movably carried by the other arm, and means for yieldingly holding said lever in inactive position, the said second-named arm of the lever being hollow and the weight being loosely fitted therein.

5. The combination of a rotary driving part, a part to be driven therefrom, a centrifugal clutch for connecting the two, said clutch being actuated from the said driving part and comprising a pivoted arm, and a weight carried loosely by said arm and movable freely toward and from the pivot thereof.

6. The combination of a rotary driving part, a part to be driven therefrom, a centrifugal clutch for connecting the two, said clutch including a pivotally-mounted hollow arm, and a weight mounted in the said arm to move freely longitudinally thereof toward and from its fulcrum.

7. The combination of a rotary driving part, a part to be driven therefrom, a clutch for connecting the two, said clutch being normally inactive and rendered active by centrifugal force, and a mobile controller for the centrifugally-actuated part of the clutch, the controller itself being automatically moved by the centrifugal force when a certain speed of rotation has been attained.

8. The combination of a rotary driving part, a part to be driven therefrom, a clutch for connecting the two, said clutch being normally inactive and rendered active by centrifugal force, and a centrifugally-controlled means for automatically increasing the heft of the centrifugal part of said clutch when a certain speed of rotation has been attained.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EMIL DYSTERUD.

Witnesses:

C. D. BAXTER,  
J. L. BARTLETT.