No. 710,685. Patented Oct. 7, 1902.

L. J. HARRIS.

FRICTION CLUTCH.

(Application filed Feb. 6, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

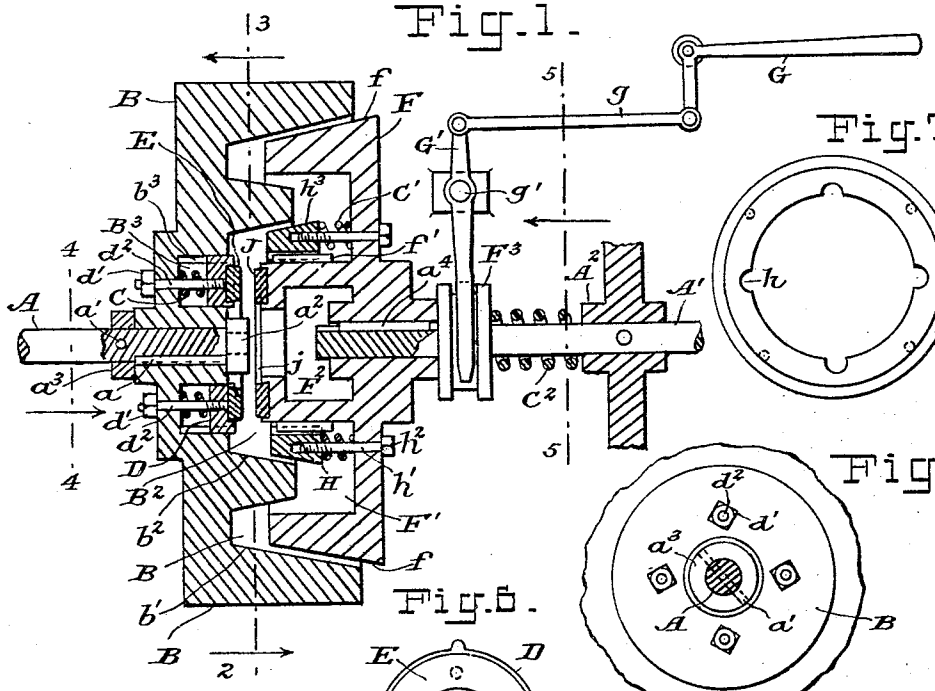


Fig. 7.

Fig. 4.

Fig. 6.

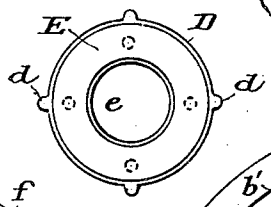


Fig. 2.

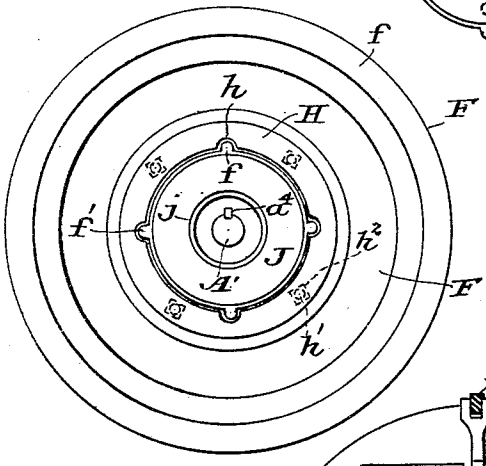


Fig. 3.

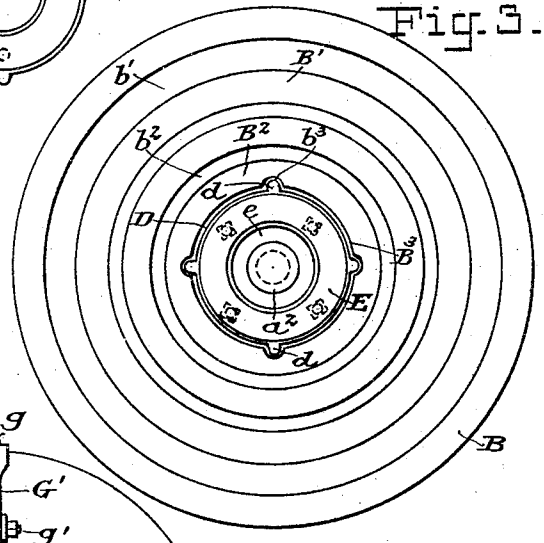
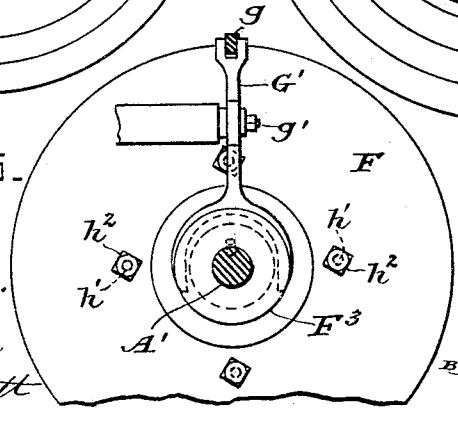


Fig. 5.



Witnesses:
E. B. Bolton
F. M. Bennett

Inventor:
L. J. Harris.
By J. O. Fowler, Jr.
his Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 710,685. Patented Oct. 7, 1902.

L. J. HARRIS.

FRICTION CLUTCH.

(Application filed Feb. 6, 1902.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 8.

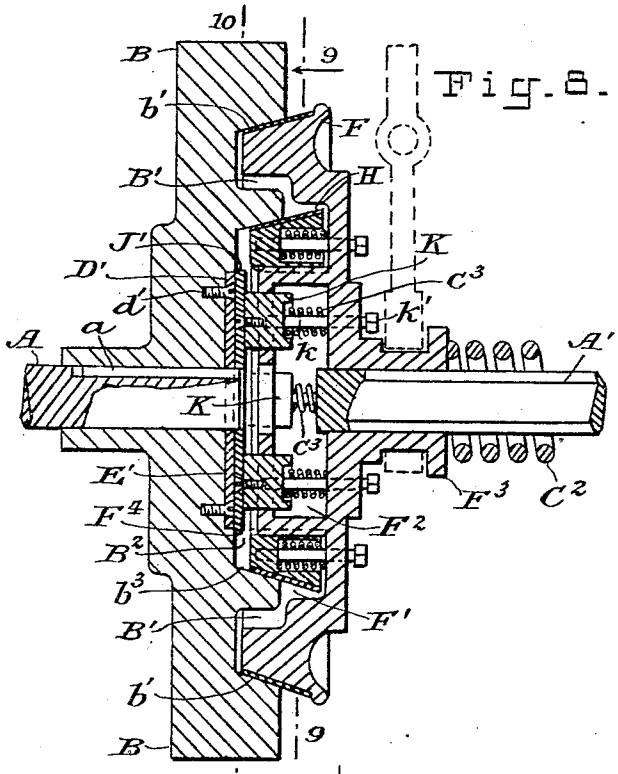


Fig. 10.

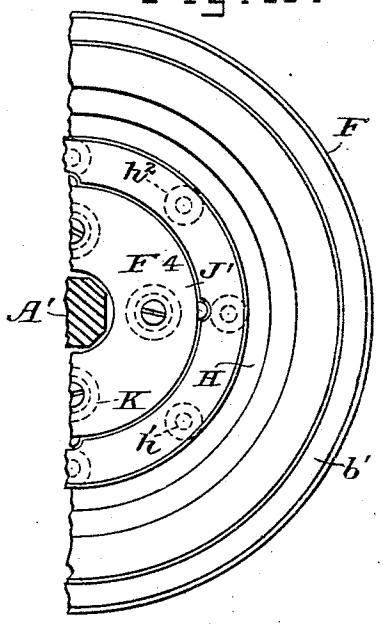


Fig. 11.

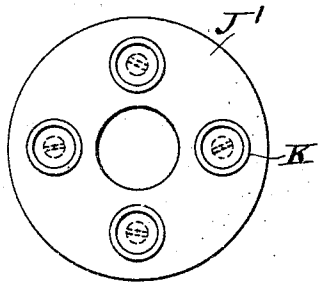


Fig. 9.

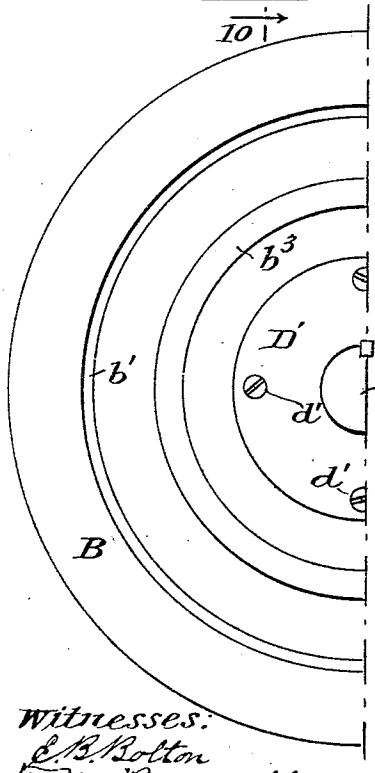
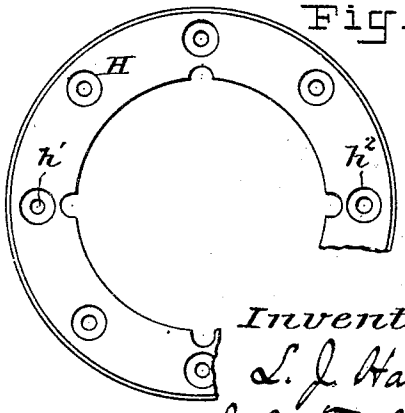


Fig. 12.



Witnesses:
E. B. Bolton
F. M. Bennett

Inventor:
L. J. Harris
By J. O. Fowler, Jr.
his Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

LOUIE J. HARRIS, OF NEW YORK, N. Y.

FRICTION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 710,685, dated October 7, 1902.

Application filed February 6, 1902. Serial No. 92,831. (No model.)

To all whom it may concern:

Be it known that I, LOUIE J. HARRIS, a citizen of the United States of America, and a resident of New York, in the county and State of New York, have invented a certain new and useful Friction-Clutch, of which the following is a specification.

My invention relates to a movable coupling or locking and unlocking contrivance used for transmitting motion or for disconnecting parts of machinery; and it has for its object the provision of an apparatus of the kind set forth simple in construction, inexpensive to manufacture, and which operates smoothly and efficiently in practical use.

In order to enable my invention to be fully understood, I will proceed to explain the same by reference to the drawings which accompany and form a part of this specification, in which—

Figures 1 and 8 represent vertical sections of clutches constructed according to my invention. Figs. 2, 3, 4, and 5 are elevations of the parts of my clutch, taken on the lines 2 2, 3 3, 4 4, and 5 5, Fig. 1. Figs. 6 and 7 are respectively views in detail of my friction plate or disk and ring shown in Figs. 2 and 3. Figs. 9 and 10 are elevations taken on the line 9 10, Fig. 8; and Figs. 11 and 12 are respectively views in detail of my friction plate or disk and ring shown in Figs. 9 and 10.

Like letters of reference indicate like parts in all the views.

I have found it desirable to make a device for conveying motion from one line of shafting to another by the gradual frictional contact of relatively movable and yielding friction-disks and conical bearing-faces differentially engaged, whereby undue wear and consequent slipping of the parts is obviated, and I have therefore constructed according to my invention an apparatus of the class described embodying the preferred construction of parts and their mutual relationship, combination, arrangement, and organization in a composite body or structure, as hereinafter described.

Referring particularly to the drawings, A and A′ denote two horizontal shafts placed in alinement and normally disengaged from each other, the shaft A being the primary or power shaft, connected with the source of power, as a motor or engine, and the shaft A′ being the secondary shaft.

Suitably mounted upon and secured to the shaft A, as by the pin a' and nuts a^2 and a^3, is one member B of my vertically-located clutch, the same being ordinarily made of metal and preferably constructed sufficiently heavy to serve as a fly or balance wheel.

The inner face of the member B is provided with two concentric recesses B′ B², each respectively provided with beveled bearing or friction faces b' and b^2, and also with another concentric interior and preferably deeper recess B³. A ring D is situated in the recess B³ and is provided with annular lugs or extensions d, constructed and arranged to engage the vertical grooves b^3, located in the outer wall of the recess B³.

The ring D is constructed and arranged to be moved toward and away from the rear portion of the member B and is held away from the same by the spring C, the distance being regulated by adjusting-nuts d', located on the bolts d^2, passing through the wall of the said member B of my clutch and attached to the ring D. Placed on the ring D is my friction plate or disk E, provided with a concentric orifice e. The other member F of my clutch is movable on a shaft A and works on a feather or key a^4 and is engaged with the other member B by means of the resilience of a spring C², located between the collar F³, rigidly secured to the member F, and a bearing A², attached to the shaft A′. I also provide means to disengage the two members B and F of my clutch—namely, a lever G′, pivoted at g' and connected by a link g with the treadle-lever G, the end of said lever G′ being bifurcated to engage and operate the collar F³ of the member F. The said member F is provided with a beveled or conical face f and also with two concentric recesses F′ and F². Upon the central portion of the inner face of the member F, I place a friction plate or disk J, provided with an orifice j. Within the recess F′, I locate a ring H, movable toward and away from the rear portion of the member F and provided with a beveled or conical face and having longitudinal grooves h, constructed and arranged to register with splines f', formed on the circular inner wall of the recess F′. The said ring H is held

away from the wall of the member F by means of a spring C′, and its position in respect thereto may be regulated by means of adjusting-nuts h^2, which work on the bolts h', passing through the said wall.

The clutch shown in Figs. 8 to 12 is in all essential particulars like the clutch shown in the other figures, with the exception that the member B in lieu of having a vertical movable friction-plate D is provided with a rigid friction-plate D′, secured to the same by screws d', which plate D′ and member B are secured to the shaft A by a key a, and the member F instead of having a stationary friction-plate J carries a movable friction-plate J′, fastened to blocks K, passing through the face F^4 and secured to and supported by bolts k, passing through the rear portion of the member F and adjusted by nuts k', and between which blocks K and wall are placed springs C^3.

In operation a frictional contact is first established by the spring C^2 between the relatively movable and yielding surfaces of the adjacent disks or plates E J at such times when the said plates are not operated by the lever or treadle G. The farther-apart differential and relatively movable and yielding conical bearing-faces b^2 and b^3 become next engaged, and finally the more distantly located and oppositely-disposed rigid and conical bearing or friction faces f and b' are contacted. By means of this gradual and differential engagement of the parts undue wear and also the slipping of the clutch, which has heretofore caused so much annoyance, are entirely obviated.

In order to disengage the members of my clutch, the lever or treadle G is moved in a downward direction, whereby the lever G′ will be caused to operate the collar F^3, and thus move the member F of my clutch away from the member B, thereby opening the clutch.

As it is evident that many changes in the construction, form, proportion, and relative arrangement of parts might be resorted to without departing from the spirit and scope of my invention, I would have it understood that I do not restrict myself to the particular construction and arrangement of parts shown and described, but that such changes and equivalents may be substituted therefor, and that

What I claim as my invention is—

1. In a clutch, a shaft, a friction-plate mounted on said shaft, a relatively yielding plate to register with the first-named plate, a spring to normally hold said plates in engagement, and a lever to control the engagement of said plates at will, and also two additional contact-faces, one of the same being yielding as regards the other, said contact-faces being located at an angle to the first-named plates, and controlled by the said lever.

2. In a clutch, a shaft a friction-plate mounted on said shaft, a relatively yielding plate to register with the first-named plate, a spring to normally hold said plates in engagement, and two additional contact-faces, one of the same being yielding as regards the other, said contact-faces being located at an angle to the first-named plates, and two oppositely-disposed rigid bearing or friction faces, and a lever to control the engagement of all of said contact-faces at will.

3. A clutch consisting of two members provided with two oppositely-disposed and relatively movable and yielding bearing or friction faces, and also with two additional oppositely-disposed and relatively movable and yielding contact-faces, located at an angle to the first-named faces.

4. A clutch consisting of two members provided with two oppositely-disposed and relatively movable and yielding bearing or friction faces, and with two additional oppositely-disposed and relatively movable and yielding contact-faces, located at an angle to the first-named faces, and also with two oppositely-disposed rigid bearing or friction faces.

5. A clutch consisting of two members provided with two oppositely-disposed and relatively movable and yielding bearing or friction faces, and also with two additional oppositely-disposed and relatively yielding contact-faces, located at an angle to the first-named faces, and means to engage the two pairs of contact-faces *seriatim*.

6. A clutch consisting of two members provided with two oppositely-disposed bearing or friction faces, and also with two additional oppositely-disposed contact-faces, located at an angle to the first-named faces, and means to engage the two pairs of contact-faces *seriatim*.

7. A clutch consisting of two members provided with two oppositely-disposed bearing or friction faces, and also with two additional oppositely-disposed contact-faces, and means to engage the two pairs of contact-faces *seriatim*.

8. A clutch consisting of two members provided with two oppositely-disposed and relatively movable and yielding bearing or friction faces, and also with two additional oppositely-disposed and relatively yielding contact-faces, and means to engage the two pairs of contact-faces *seriatim*.

9. A clutch consisting of two members provided with two oppositely-disposed and relatively yielding bearing or friction faces and with two additional oppositely-disposed and relatively yielding contact-faces, located at an angle to the first-named faces, and also with two other oppositely-disposed contact-faces, and means to engage the three pairs of contact-faces *seriatim*.

10. A clutch consisting of two members provided with two oppositely-disposed bearing or friction faces, and with two additional oppositely-disposed contact-faces, located at an angle to the first-named faces, and also with

two other oppositely-disposed contact-faces, and means to engage the three pairs of contact-faces *seriatim*.

11. A clutch consisting of two members provided with two oppositely-disposed bearing or friction faces, and with two additional oppositely-disposed contact-faces, and also with two other oppositely-disposed contact-faces, and means to engage the three pairs of contact-faces *seriatim*.

12. A clutch consisting of two members provided with two oppositely-disposed and relatively movable and yielding bearing or friction faces, and with two additional oppositely-disposed and relatively yielding contact-faces, and also with two other oppositely-disposed contact-faces, and means to engage the three pairs of contact-faces *seriatim*.

In testimony of the foregoing specification I do hereby sign the same, in the city of New York, county and State of New York, this 14th day of January, A. D. 1902.

LOUIE J. HARRIS.

Witnesses:

J. ODELL FOWLER, Jr.,

ROB. SCHWARZ.