No. 671,219. Patented Apr. 2, 1901.

A. LEIKEM.

FRICTION CLUTCH.

(Application filed Oct. 5, 1900.)

(No Model.)

Fig. 2.

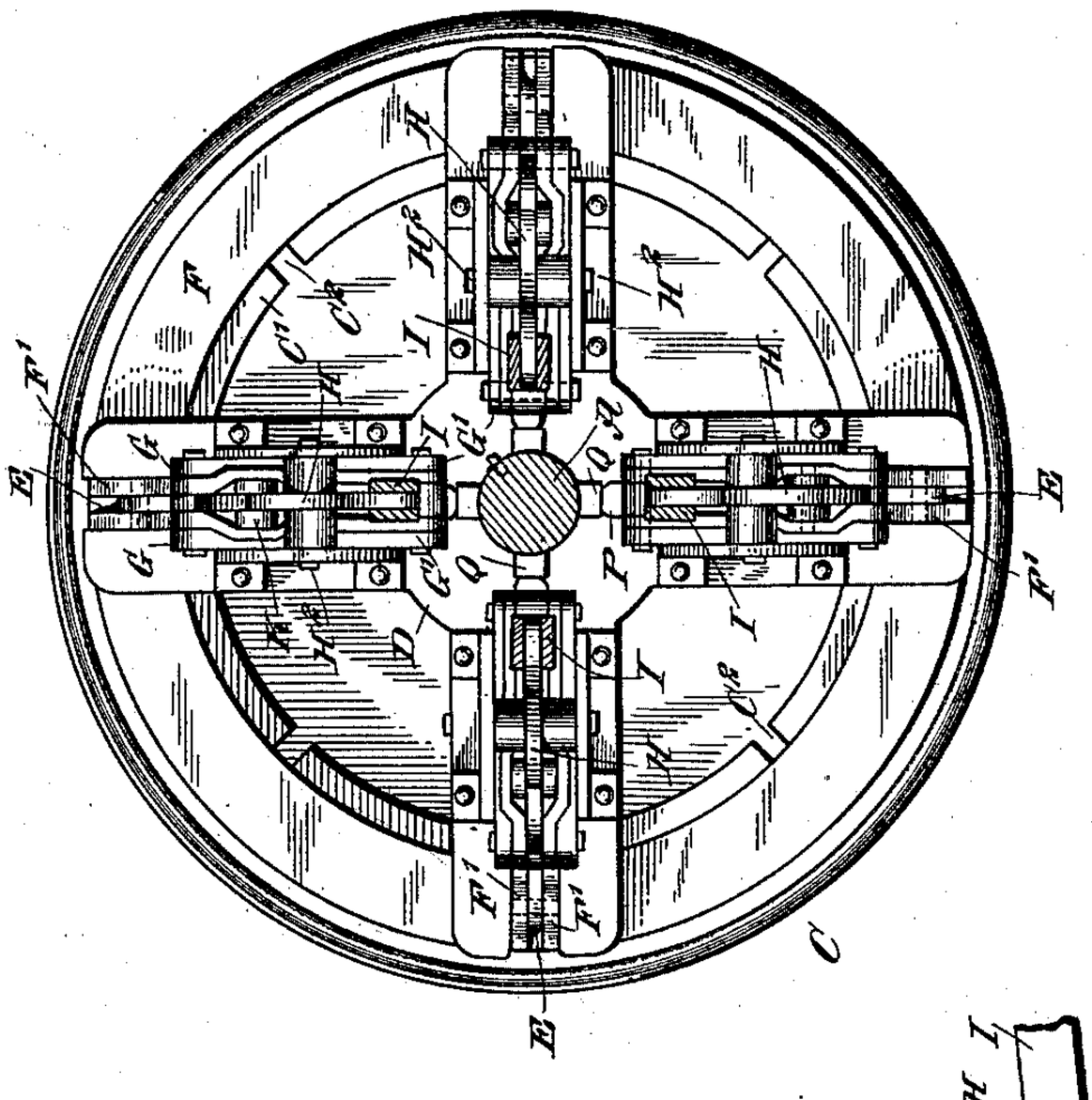


Fig. 3.

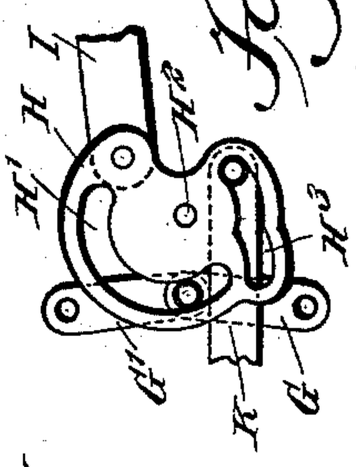
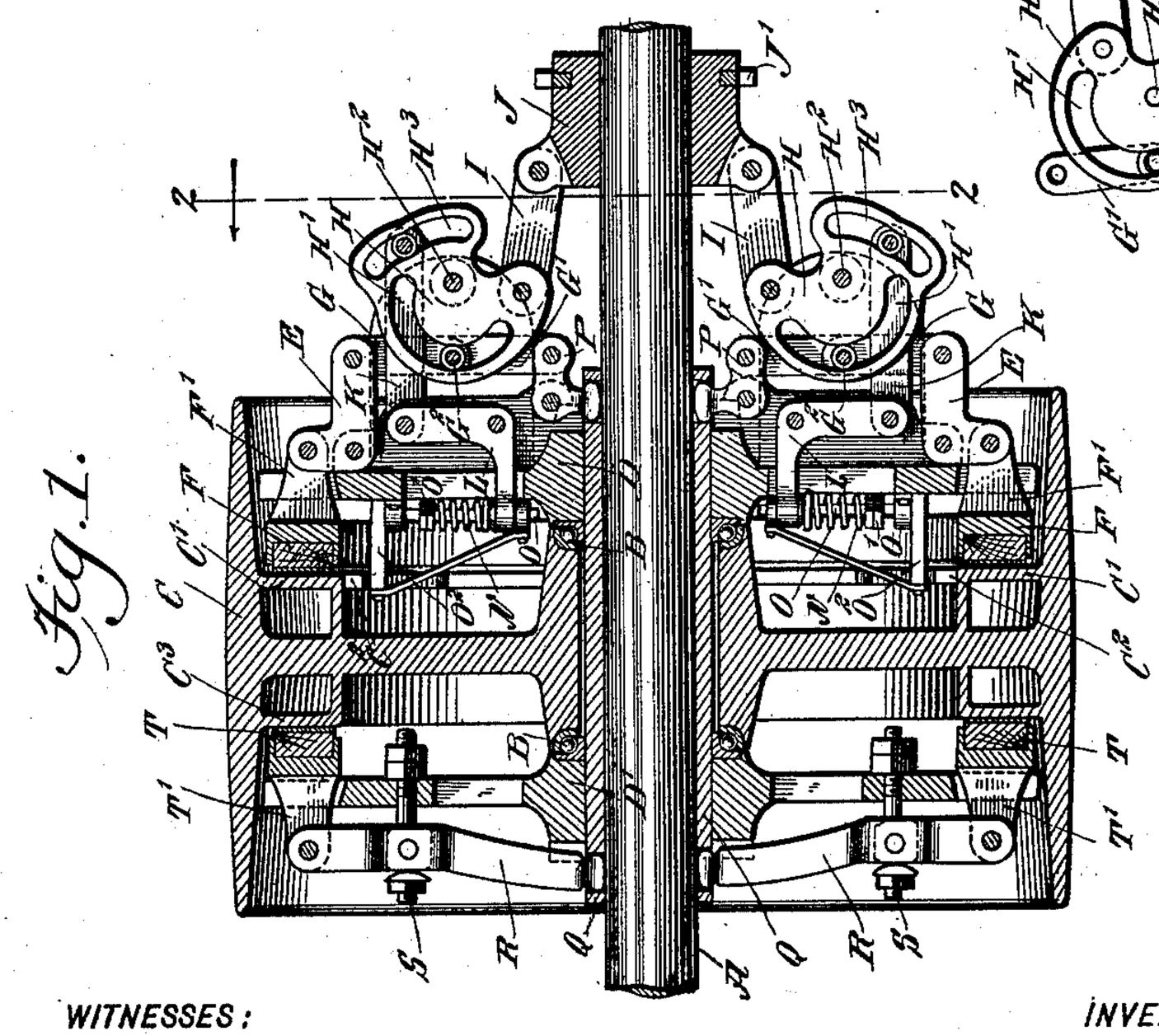


Fig. 1.



WITNESSES:

A. Rettpleman Jr.

Rud. J. Hoster Jr.

INVENTOR

Anton Leikem.

BY Munn & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

ANTON LEIKEM, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO OSCAR M. SHERWOOD, OF SAME PLACE.

FRICTION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 671,219, dated April 2, 1901.

Application filed October 5, 1900. Serial No. 32,105. (No model.)

To all whom it may concern:

Be it known that I, ANTON LEIKEM, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Friction-Clutch, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved friction-clutch arranged to permit of conveniently taking up wear and to insure positive locking of the pulley to the driven part in case the friction-blocks slip under a heavy load.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional elevation of the improvement. Fig. 2 is a cross-section of the same on the line 2 2 in Fig. 1, and Fig. 3 is a side elevation of one of the cams and adjacent devices with parts in different positions.

On the driven shaft A are arranged ball-bearings B, on which rotates loosely a friction-pulley C, and on said shaft are keyed or otherwise secured spiders D D′, located on opposite sides of the web of the pulley, as is plainly shown in Fig. 1, the hubs of the spiders abutting against the end of the hub of the pulley C, so that the latter is prevented from slipping lengthwise. On the spider D are fulcrumed a number of bell-crank levers E, each of which is connected with a lug F′, projecting from a friction-block F, adapted to engage the face C′, formed on the pulley C, near the rim thereof, as is plainly indicated in Fig. 1. The bell-crank lever E is also connected with a toggle-lever G, pivoted to a toggle-lever G′, the pivot G^2, connecting the toggle-levers G G′ with each other, extending into a cam-groove H′ in a cam H, fulcrumed at H^2 on brackets projecting from the spider D. The cams H are pivotally connected by a link I with a shifting collar J, mounted to slide on the shaft A and engaged by the usual shifting fork J′ under the control of the operator. When the collar J is moved inward toward the pulley C, then the several links I impart a turning motion to the cams H, so that the toggle-levers G G′ are actuated to cause the bell-crank levers E to move the friction-block F in frictional contact with the face C′ of the friction-pulley C, as is plainly shown in Fig. 1, so that the driven spider D, on which the several devices are carried, causes the friction-block to rotate the pulley C. When the shifting collar J is moved outward, then the cams H are turned in the opposite direction, whereby the toggle-levers G G′ are opened, and the bell-crank levers E then cause the friction-block F to move out of engagement with the face C′, and consequently the pulley C now ceases to rotate. Each of the cams H is also provided with a cam-groove H^3, connected by a link K with a bell-crank lever L, fulcrumed on the spider D and engaging one end of spring N, pressing with its other end on a collar O′, held on a rod O, mounted to slide in suitable bearings on the spider D. The rod O is formed at its outer end with an arm O^2, normally resting against the inner edge of the face C′, but adapted to engage notches C^2, cut in the said face, as is plainly shown in Fig. 2, to positively lock the spider D to the friction-pulley C in case the friction-block F slips on the face C′ under a heavy load.

In using the device the shifting collar J is moved inward, as described, to bring the friction-block F in frictional contact with the face C′ of the friction-pulley C to rotate the latter under ordinary circumstances, and when a further inward movement is given to the said shifting collar J then the toggle-levers G G′ are not further affected, owing to the shape of the cam-grooves H′; but the other cam-groove H^3 causes the link K to impart a swinging motion to the bell-crank lever L, so that the spring N is compressed to hold the arm O^2 in firm contact with the edge of the face C′, and in case slipping now takes place between the face C′ and the friction-block F then the arms O^2 finally come into engagement with the notches C^2 to positively lock the spider D to the friction-pulley C and insure a positive rotation of the friction-pulley under a heavy load.

The inner end of each toggle-lever G′ is pivotally connected with a bell-crank lever P, fulcrumed on the spider D and engaging a recess in a bar Q, mounted to slide longitudinally in suitable recesses formed in the spiders D D′. The several bars Q extend beyond the spider D′ (see Fig. 1) and are connected at this end of the machine with the inner end of levers R, fulcrumed on bolts S, attached to the spider D′, the outer ends of said levers R being connected with lugs T′ of a second friction-block T, adapted to engage a face C^3, formed on the friction-pulley C^3 at the opposite side of the pulley-web to that on which the face C′ is located. Now when the shifting collar J is moved inward, as above described, to move the friction-block F in engagement with its face C′ then at the same time the toggle-levers G′ actuate the bell-crank levers P, so that the bars Q receive a sliding motion and in doing so impart a swinging motion to the levers R to move the friction-block T in frictional contact with the face C^3 of the pulley C. Thus the two friction-blocks F and T move simultaneously in engagement with the faces C′ and C^3 of the friction-pulley C to insure a proper rotation of the pulley C from the driven part—that is, the shaft A. When the shifting collar J is moved outward, the bell-crank levers P are actuated in a reverse direction to cause the bars Q to slide from the left to the right, so that the levers R move the friction-block T out of engagement with the face C^3 at the time that the friction-block F moves out of engagement with the face C′.

The fulcrum of each lever R is adjustable on its bolt S, so that wear on the friction-blocks T and F can be readily taken up by adjusting the fulcrum accordingly. Each of the friction-blocks F and T is preferably constructed with an annular shell in which wooden blocks are set, formed with faces of paper fiber; but I do not limit myself to this particular construction of the friction-blocks, as the same may be varied.

By having two friction-blocks engaging opposite faces of the friction-pulley all twisting strain is completely avoided and a firm connection between the driven part and the pulley to be driven is obtained.

In case slipping takes place between the block F and its face C′ when a heavy load is thrown on the pulley C then the locking device above described positively locks the spider D to the pulley, so that the latter is positively rotated from the driven part.

The wear on the shaft is avoided, as the pulley C rotates on the ball-bearings B, and in case the latter are worn out they can be readily removed and new ones put in place.

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

1. A friction-clutch having a driven part, a pulley to be driven and provided with friction-faces and notches, friction-blocks on the driven part and engaging the said face, an operating device for moving the friction-blocks in or out of engagement with said friction-face, and a locking device controlled by said operating device, and arranged to positively lock said pulley to said driven part when the blocks slip on the face, as set forth.

2. A friction-clutch, comprising a driven part carrying a spider, a pulley to be driven and provided with a friction-face and notches, a friction-block adapted to engage said face, bell-crank levers carrying the friction-block and fulcrumed on said spider, toggle-levers connected with said bell-crank levers, cams engaging said toggle-levers, means under the control of the operator for turning said cams and moving said friction-block in or out of engagement with said friction-face, and locking devices controlled by said cams and arranged to engage the notches in the pulley to positively lock said pulley to said driven part, as set forth.

3. A friction-clutch, comprising a driven part carrying a spider, a pulley to be driven and provided with a friction-face and notches, a friction-block adapted to engage said face, bell-crank levers carrying the friction-block and fulcrumed on said spider, toggle-levers connected with said bell-crank lever, a cam engaging said toggle-levers, means under the control of the operator, for turning said cams and moving said friction-block in or out of engagement with its friction-face, a second set of bell-crank levers carried by said spider and connected with said cams, and spring-pressed arms controlled by said second bell-crank levers and adapted to engage the notches in the pulley to be driven, as set forth.

4. A friction-clutch, comprising a driven part carrying a spider, a pulley to be driven and provided with a friction-face and notches, a friction-block adapted to engage said face, bell-crank levers carrying the friction-block and fulcrumed on said spider, toggle-levers connected with said bell-crank lever, a cam engaging said toggle-levers, means under the control of the operator, for turning said cams and moving said friction-block in or out of engagement with its friction-face, longitudinal bars mounted to slide and controlled by said toggle-levers, a second spider on the driving part, levers fulcrumed on said second spider and connected with said bars, and a second friction-block connected with said levers and adapted to engage a second friction-face on said friction-pulley, as set forth.

5. A friction-clutch having a pulley with opposite friction-faces, separate friction-blocks for engagement with the said faces, means for moving one of said friction-blocks in or out of engagement with one of the friction-faces of the pulley, longitudinal bars mounted to slide and controlled by said means, and levers connected at their inner ends with the said bars and at their outer ends with the other friction-block to move the same in or

out of engagement with the other friction-face of the pulley, as set forth.

6. A friction-clutch, comprising a driven part carrying a spider, a pulley to be driven and provided with a friction-face, a friction-block adapted to engage said face, bell-crank levers carrying the friction-block and fulcrumed on the spider, means for operating said bell-crank levers to move the friction-block in or out of engagement with said friction-face, longitudinal bars mounted to slide and controlled by said operating means, a second spider on the driven part, levers fulcrumed on the said second spider and connected with the said bars and a second friction-block connected with said levers and arranged to engage a second friction-face on the pulley, as set forth.

7. A friction-clutch, comprising a pulley loosely mounted on a driven part and having a friction-face, a friction-block for engagement with the said face, means for moving the said friction-block in or out of engagement with said face, and a locking device carried by the said driven part and controlled by the friction-block-operating means, the said locking device being arranged to engage the pulley to positively lock the same to said driven part, substantially as set forth.

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

ANTON LEIKEM.

Witnesses:

JAMES W: ODELL,

WILLIAM GOLDFINGER.