(No Model.)

A. LESPERANCE.

CLUTCH.

No. 463,812. Patented Nov. 24, 1891.

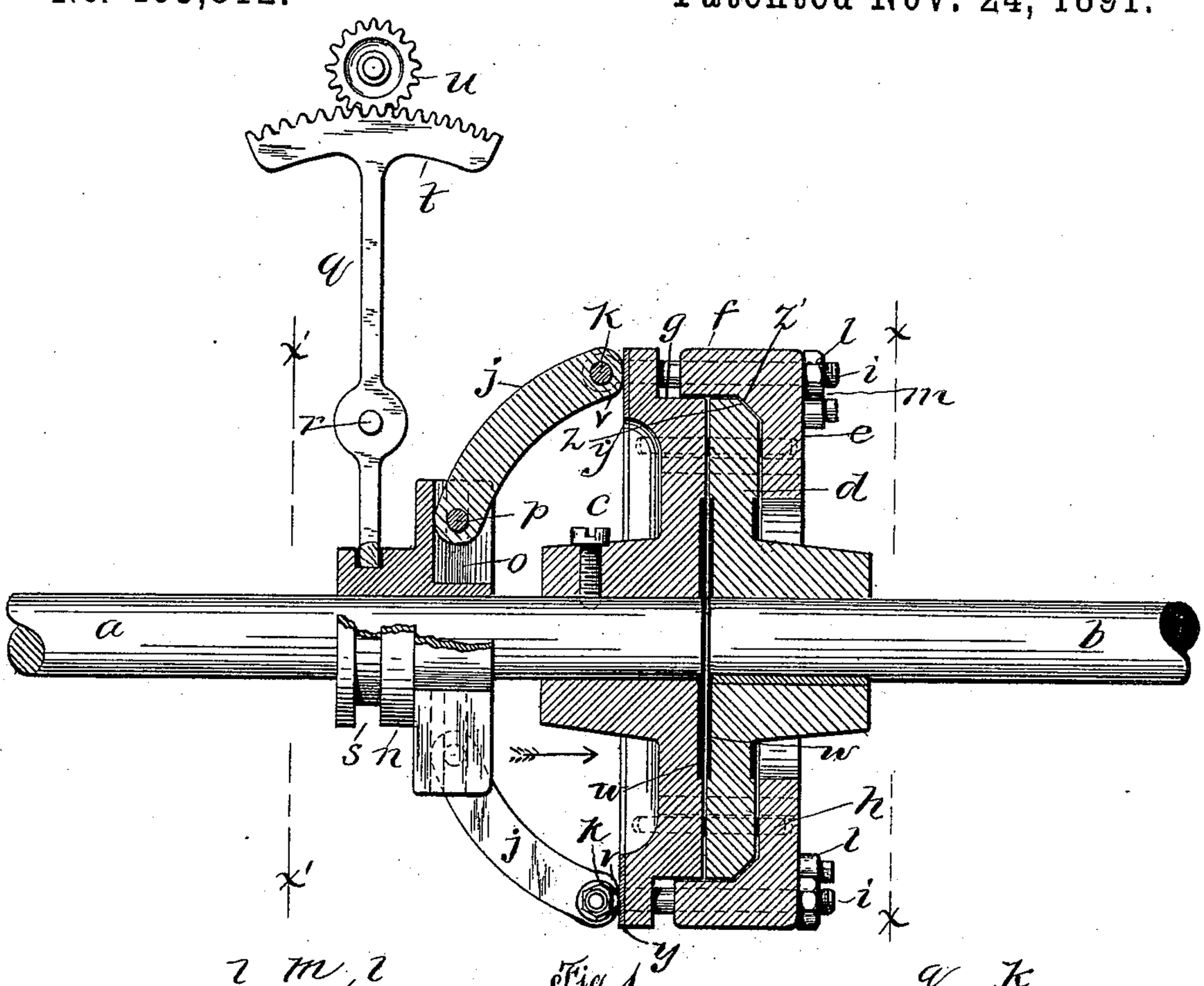

Fig. 1.

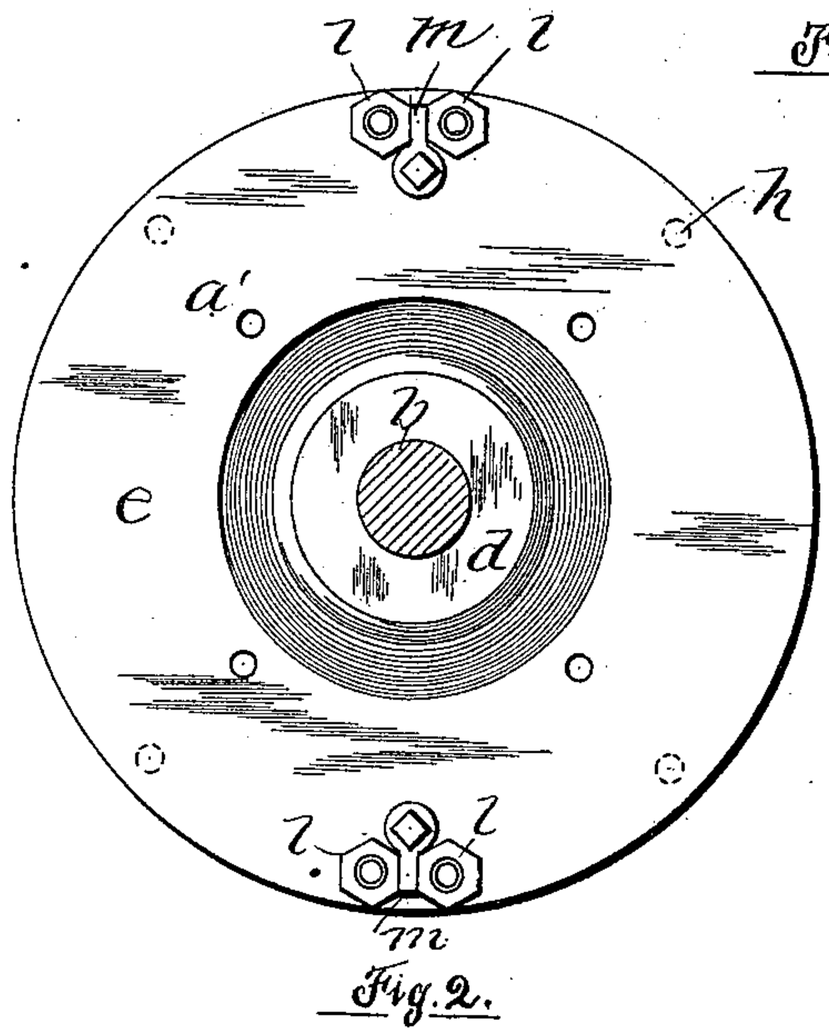

Fig. 2.

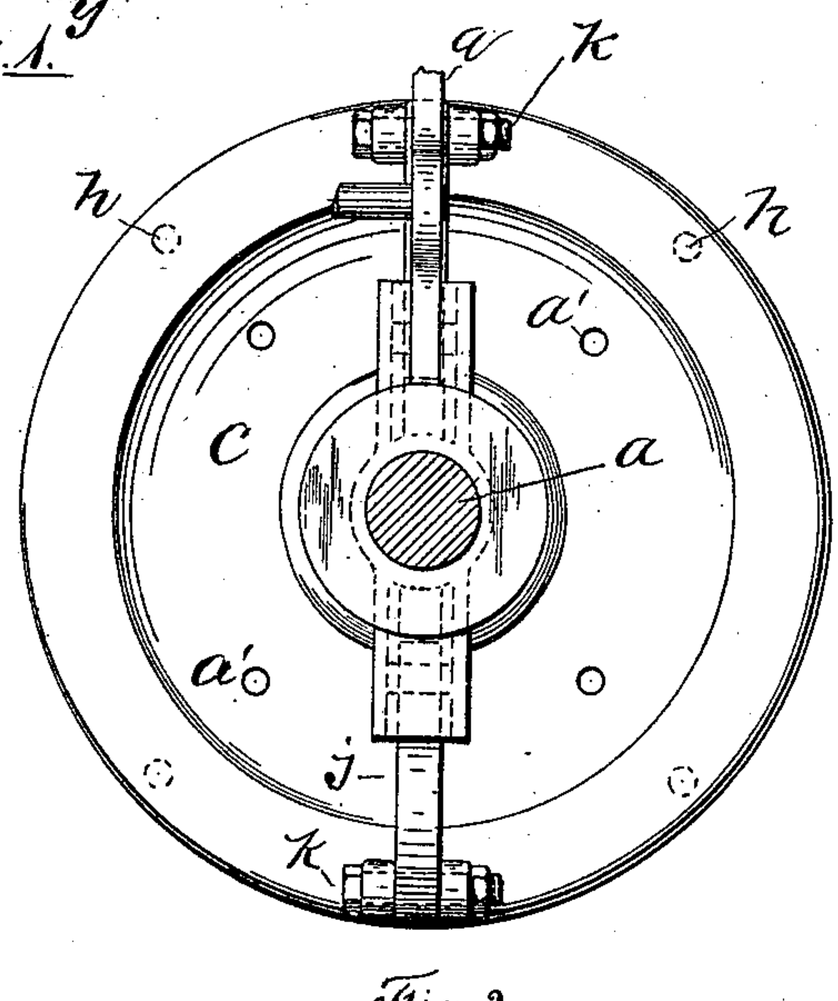

Fig. 3.

Witnesses
A. D. Harrison.
D. A. McShane.

Inventor
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UNITED STATES PATENT OFFICE.

ALEXANDER LESPERANCE, OF LACONIA, NEW HAMPSHIRE, ASSIGNOR TO THOMAS H. WORRALL, OF SAME PLACE.

CLUTCH.

SPECIFICATION forming part of Letters Patent No. 463,812, dated November 24, 1891.

Application filed February 16, 1891. Serial No. 381,674. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER LESPERANCE, of Laconia, in the county of Belknap and State of New Hampshire, have invented certain new and useful Improvements in Clutch or Coupling Mechanisms, of which the following is a specification.

It is the object of my invention to so improve friction-clutches as to increase their efficiency and durability and at the same time render the same as economic of and simple in construction as may be in view of the functions performed by them.

My invention consists of improvements which I will now proceed to describe and claim, reference being had to the annexed drawings, and to the letters of reference marked thereon, the same letters designating the same parts or features, as the case may be, wherever they occur.

In the said drawings, Figure 1 is a sectional side view of my improved friction-clutch applied to a driving and driven shaft. Fig. 2 is a sectional end view on the line *x x* of Fig. 1, a part of the means for operating the clutch being omitted. Fig. 3 is a view similar to Fig. 2, the section being taken on the line *x' x'* of Fig. 1.

In the drawings, *a* designates the driving-shaft, and *b* the driven shaft or shaft to be driven.

c is a disk or flange of a hub keyed upon shaft *a*. *d* is a similar disk or flange, splined upon shaft *b*. It were as well, however, to key disk *d* upon its shaft and to spline disk *d* upon shaft *a*, or both disks might be splined upon their respective shafts.

e is a flange-ring arranged to operate upon the outer face of the disk *d*, the flange *f* of said ring extending over the periphery of said disk *d* and over a shoulder *g*, formed on disk *c*. The ring *e* is provided in its flanged portion with dowel-pins, (represented by the dotted lines *h*,) which extend into holes formed in the inner face of the disk *c* near its circumference, whereby the ring *e* and disk *c* may turn in unison.

i i represent bolts, which are connected with the flange *f* of ring *e*, and which extend through suitable apertures formed in disk *c*, the construction of the ends of the said bolts which project beyond the outer face of disk *c* being such as to adapt the adjacent ends of cam-lever *j* to be fulcrumed thereon. The construction for the purpose mentioned, as here shown, consists of a fulcrum-pin *k*, passed through eyes formed in the ends of the bolts and through a hole formed in the adjacent end of the cam-lever arranged between the projecting ends of the said bolts. Nuts *l* are screwed upon the opposite ends of the bolts and are locked thereon by means of plates *m*, bolted upon the outer face of flanged ring *e*, as shown in Fig. 2.

n designates a collar, movable longitudinally upon the shaft *a* and provided with a groove *o* to receive a pin *p* or other suitable means for loosely connecting what may be considered as the free ends of the cam-levers with the collar *n*.

q designates a lever fulcrumed on a stud or pivot *r*, the said lever having its inner end provided with a fork engaging the groove *s* in the collar *n*, and its outer end provided with a toothed segment *t*, engaged by a pinion *u*, so that by rotating the said pinion in one direction or the other the cam-levers may be moved to frictionally connect the two clutch parts or disks *c d*, so as to drive the shaft *b* from the shaft *a*, or so as to disconnect the said clutch parts and allow shaft *a* to rotate without effect upon the shaft *b*. When it is desired to frictionally connect the two clutch parts, the pinion *u* will be rotated so as, through the medium of lever *q*, to move the collar *n* inward in the direction indicated by the arrow in Fig. 1, causing the cam-levers *j* to be rocked on their fulcrum-pivots, and the cam-faces *v* on the inner ends of said levers to bear against the outer face of the disk *c*, drawing ring *e* and disk *d* toward disk *c* and frictionally connecting the said disks, as may be understood without further description.

Facings *w*, of leather or other suitable friction material, may be applied in any proper way to the adjacent faces of the two disks or clutch parts *c d* to enhance the frictional connection therebetween. A hardened steel plate *y* may be applied to the outer face of the clutch part *c* at the points where the cam-levers act upon the said clutch part to provide against wear at the said points. In case of wear of any of the parts so that the movements of the cam-levers and the action of

their cam-faces *v* will not effect an efficient frictional connection of the two clutch parts, the nuts *l* on bolts *i* may be so adjusted as to secure a proper relationship of the parts and secure the desired operation thereof. I may bevel the outer face of the clutch part or disk *d* at its outer edge, as at *z*, and provide the inner face of the ring *e* at an opposite point with an inclined surface *z'*, by which means a perfect alignment of shafts *a* and *b* may be maintained should there be a tendency of the said shafts to get out of alignment. Instead of making the clutch parts or one of them movable on the shafts, they may be secured thereto, and the shafts or one of them be made to move longitudinally in order to clamp the parts together, but a very slight movement being necessary to connect and discontinue the parts.

a' designates holes formed through the two clutch parts for the reception of bolts to positively connect the two parts in the event of the failure of the friction means to effect a clutching of the parts. This feature of an interconvertible friction and positive clutch mechanism is very important, especially in the operation of electric-light plants, force-pumps, &c.

It is to be observed that the shaft *a* may be made the driving-shaft, and the shaft *b* the driven part, the construction and arrangement of the parts comprising the invention remaining as herein shown and described, and the same functions being secured. Furthermore, the driven part of the clutch may be a pulley or gear by which motion is transmitted to a machine or wheel; and other means than that herein shown and particularly described may be employed for clamping the disks or flanges together.

Other changes, it is manifest, may be made in the form and arrangement of parts comprising the improvement without departing from the nature or spirit of the invention.

Having thus explained the nature of my invention and described a way of constructing and using the same, I declare that what I claim is—

1. A friction-coupling comprising two friction-disks, one being provided with a beveled surface and a ring or collar provided with an inclined surface *z'*, adapted to co-operate with the beveled surface of one of the disks, and clamping devices connected with the ring and one of the disks for clamping the two disks together, as set forth.

2. A friction-coupling comprising two clutch parts, consisting of two friction disks or flanges, one arranged upon one and the other upon the other of the shafts to be connected by the coupling and one of the disks being secured to its shaft and one disk being provided with a beveled surface, a ring or collar independently movable longitudinally of the the shaft and provided with an inclined surface *z'*, adapted to co-operate with the beveled surface of one of the disks, and clamping devices connected with the flanged ring and one of the disks for clamping the two disks together and centering the same, as set forth.

3. A friction-coupling comprising two friction-disks *c d*, the disk *c* being provided with a shoulder and one of the disks having a beveled surface, an independently-movable ring *e*, provided with a flange extending over the periphery of disk *d* and upon the shoulder of disk *c*, the said ring having an inclined surface *z'*, adapted to co-operate with the beveled surface of one of the disks, and clamping devices connected with the ring and one of the disks for clamping the two disks together, as set forth.

4. A friction-coupling comprising two clutch parts, consisting of two friction disks or flanges, one arranged upon one and the other upon the other of the sections or shafts to be connected by the coupling and one disk being provided with a beveled surface, a flanged ring or centering-collar independently movable longitudinally of the shaft, with the flange extending over the periphery of one of the disks and upon the periphery of the other disk, the said ring being provided with an inclined surface *z'*, adapted to co-operate with the beveled surface of one of the disks, bolts *i*, provided with nuts *l*, passing through said ring and one of the said disks, as set forth.

5. A friction-coupling comprising two clutch parts, consisting of two friction disks or flanges, one connected with the driving and the other with the driven means, one disk being provided with a beveled surface, a movable ring or collar adapted to operate against one clutch part and loosely connected with the other clutch part, the said ring being provided with an inclined surface to co-operate with the beveled surface of one of the disks, and cam-levers fulcrumed on the said connecting means and bearing on the latter clutch part to frictionally connect and release the said clutch parts, as set forth.

6. The combination, with the driving and driven shafts and the clutch parts *c* and *d* thereon, the latter part being provided with the beveled face *z*, of the ring or centering-collar *e*, provided with the inclined surface *z'* and means for clamping the said ring on the said clutch part *d* and drawing the two clutch parts together in the same line or plane, and bolts *i*, provided with nuts *l*, passing through said ring and one of the said disks, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 12th day of February, A. D. 1891.

ALEXANDER LESPERANCE.

Witnesses:
FRED L. SMITH,
CHARLES HOYT.