(No Model.) 2 Sheets—Sheet 1.

A. C. RICE.

FRICTION CLUTCH.

No. 559,064. Patented Apr. 28, 1896.

Fig 1.

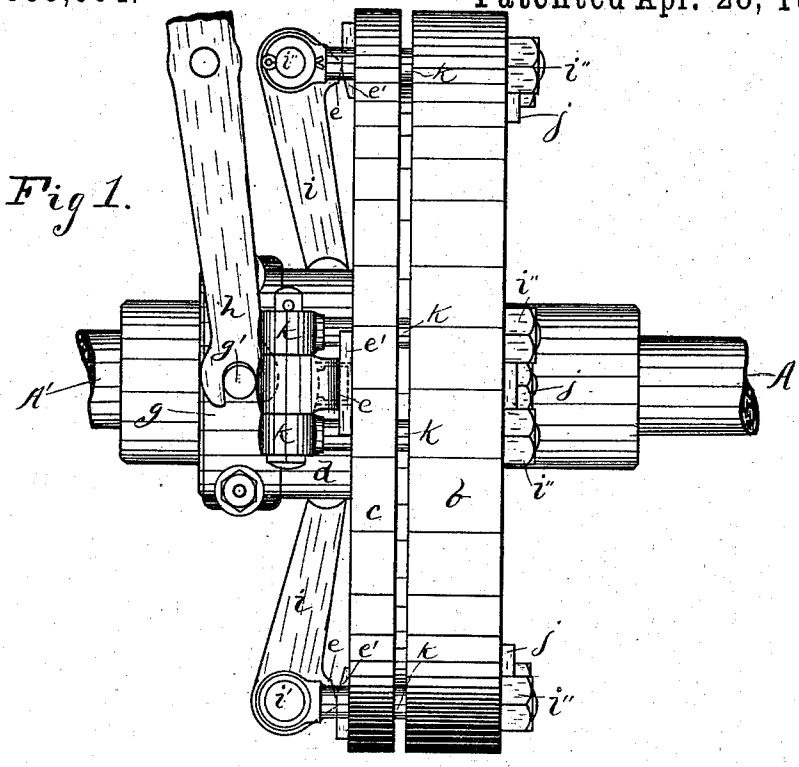
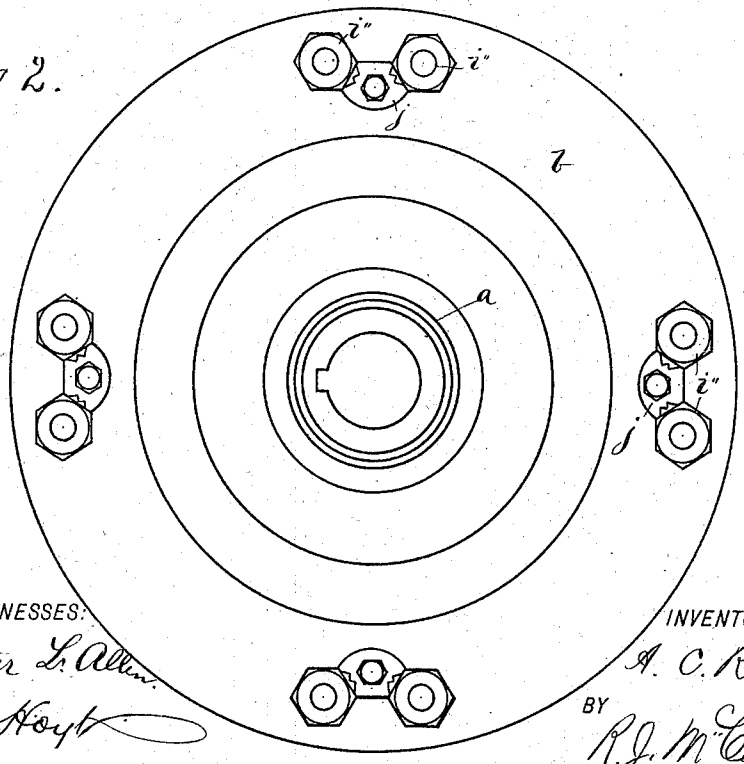


Fig 2.



WITNESSES:
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(No Model.) 2 Sheets—Sheet 2.

A. C. RICE.

FRICTION CLUTCH.

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Fig 3.

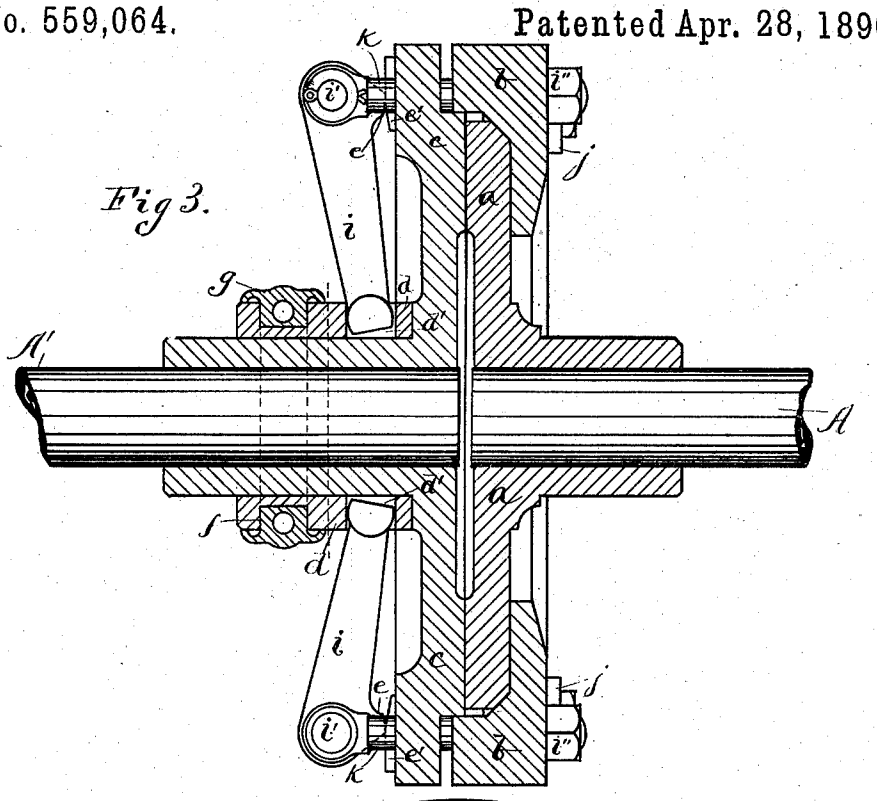
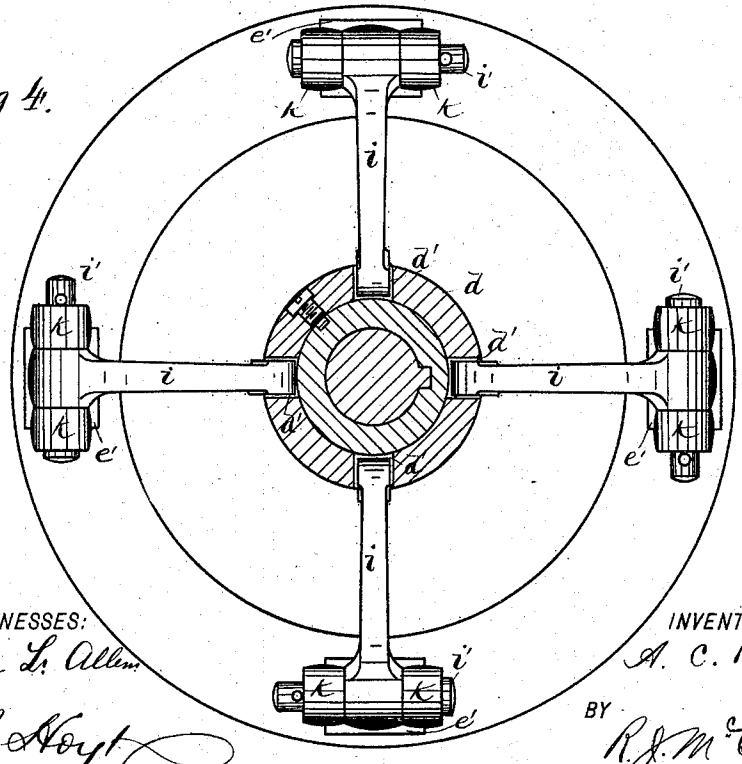


Fig 4.



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UNITED STATES PATENT OFFICE.

ALVA C. RICE, OF DAYTON, OHIO, ASSIGNOR TO THE STILWELL-BIERCE & SMITH-VAILE COMPANY, OF SAME PLACE.

FRICTION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 559,064, dated April 28, 1896.

Application filed June 6, 1895. Serial No. 551,868. (No model.)

To all whom it may concern:

Be it known that I, ALVA C. RICE, of Dayton, county of Montgomery, State of Ohio, have invented a new and useful Improvement in Friction-Couplings; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in friction-couplings for shafting.

Owing to the positions of various shafting and the frequent lack of necessary space for the attachment of the most desirable forms or constructions of couplings now in use, great difficulty is experienced in making necessary shaft connections, necessitating sometimes the changing of the position of the shafting in order to obtain available space for said coupling. Therefore one of the objects of the present invention is to provide a friction-coupling that occupies comparatively small space on the shafting.

A further object of the invention is to provide a compact coupling mechanism which moves in a comparatively small space and exerts the smallest possible strain upon the shafting, to the end that the said shafting may be maintained in proper alinement and prevented from sagging or being influenced by torsional strain.

To these ends the improvements consist of parts and the construction and arrangement thereof that will be fully described in the specification, and the specific points of novelty set out in the claim.

Referring to the annexed drawings, upon which similar letters of reference indicate corresponding parts, Figure 1 is a side elevation of a friction-coupling having my improvements thereon; Fig. 2, an end elevation of the same; Fig. 3, a section through the axis of the coupling; Fig. 4, an end elevation.

A and A′ designate a divided shaft, the former part constituting a primary or driving shaft, on which a friction-disk *a* is keyed or otherwise rigidly mounted.

b designates an annular clamping-plate that embraces the outer side and projects over the periphery of the disk *a*.

c designates a friction-disk secured to the shaft A′, and *d* is a sleeve that incloses the hub of said disk and is secured thereto. This sleeve is provided with an annular groove *f*, in which is loosely fitted a shifting ring *g*, preferably made of composition. The said ring *g* has trunnions or lugs *g′* projecting from its sides, with which the bifurcated end of a shifting-lever *h* engages. The sleeve *d* has, further, on its inner end four square openings *d′*, into which the inner ends of levers *i* project. The upper ends of said levers are fulcrumed on transverse pivot-bolts *i′*, which have bearings in eyes formed in the heads of bolts *k*. The bolts *k* pass loosely through the clamping-plate *b* and disk *c* and are provided with adjusting-nuts *i*,[11] by which said bolts are maintained in a fixed position and thereby prevented from becoming loose.

j designates serrated lock-nuts, one of which is placed between each pair of the adjusting-nuts *i″* to prevent the latter from becoming loose or shifting out of a proper position. On the upper end of each of the levers *i* there is an inwardly-projecting cam-surface *e*. Adjacent to this cam-surface there is a plate *e′*, projecting from the disk *c* and having an inclined surface, against which the cam-surface *e* on the levers *i* comes in contact when said levers are moved slightly inward by the shifting-lever. The effect of this engagement of the cam-levers with the plates *e′* is to draw the friction-disks *a* and *c* together through the mediums of the bolts *k* and clamping-plate *b*.

As shown in the drawings, the disks *a* and *c* are in frictional contact, the levers *i* having been moved inwardly from a plane approximately on a line with the fulcrums of said levers. It will thus be observed that said levers and the shifting ring *g* are required to move but a short distance to obtain this result, and that the whole construction of the coupling can be compact, to the end that no extended or considerable movement of the devices is necessary in order to bring the disks in contact. Therefore the danger of getting the shafting out of a proper alinement is obviated. I do not claim to be the originator of the friction-disk, or that the same is any

part of the present invention; but heretofore too great a throw of the levers was necessary in order to effect a contact of said disks. Therefore too much space on the shafting has been required in order to accommodate the mechanism.

I am aware that it is not new to provide a friction-disk with an extended hub upon which a shifting sleeve is mounted. Such a construction has been heretofore provided, but not with a view to adapting the clutch mechanism to be utilized in the smallest possible space, but solely with a view to providing a friction-clutch at one end and a tooth-clutch at the other end of said hub. I am further aware that it is not new to pivot the inner ends of the shifting-levers directly to the shifting sleeve. Therefore I do not claim such construction.

Having fully described my invention, I claim—

In a friction clutch or coupling, the combination with friction-disks one of which is provided with a hub the length of which is less than the diameter of the disk, a shifting sleeve mounted on said hub in close proximity to the face of the disk and which is provided with a series of square openings in its inner end, of shifting-levers having their outer ends fulcrumed adjacent to the periphery of said disk and their inner ends loosely inserted in the openings in said sleeve, the said levers having cams thereon, and being adapted to move in fixed arcs from positions parallel with the face of said disk, substantially as and for the purposes specified.

In testimony whereof I have hereunto set my hand this 27th day of May, 1895.

ALVA C. RICE.

Witnesses:
S. A. DICKSON,
R. J. MCCARTY.