(No Model.) 4 Sheets—Sheet 1.

# L. H. BRIGHTMAN.

## FRICTION CLUTCH.

No. 456,534. Patented July 21, 1891.

Fig. 1

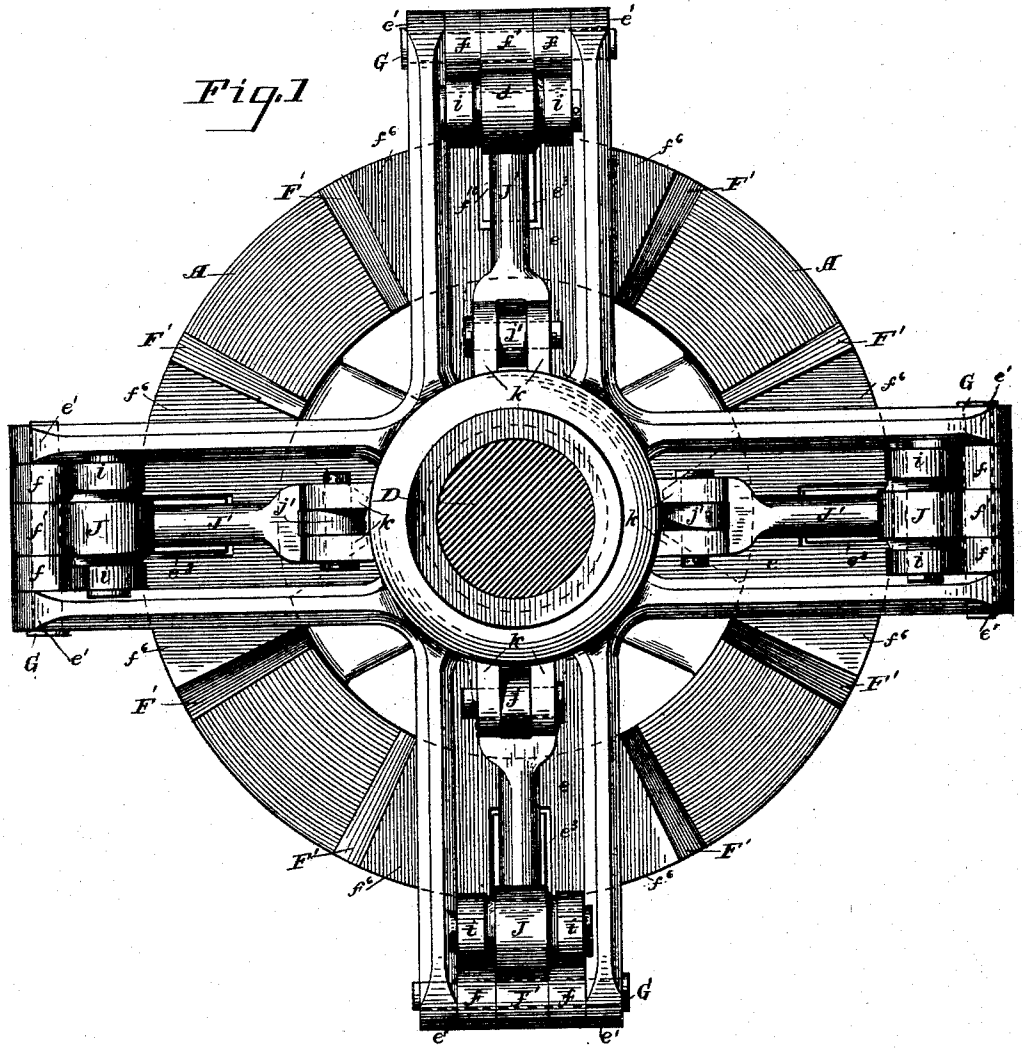
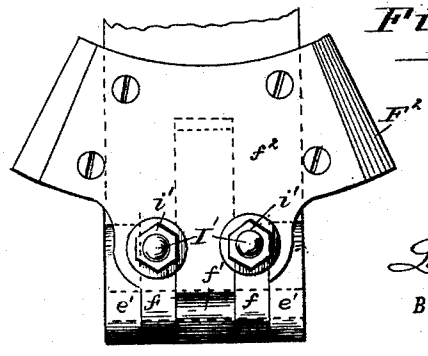


Fig. 2



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# L. H. BRIGHTMAN.

## FRICTION CLUTCH.

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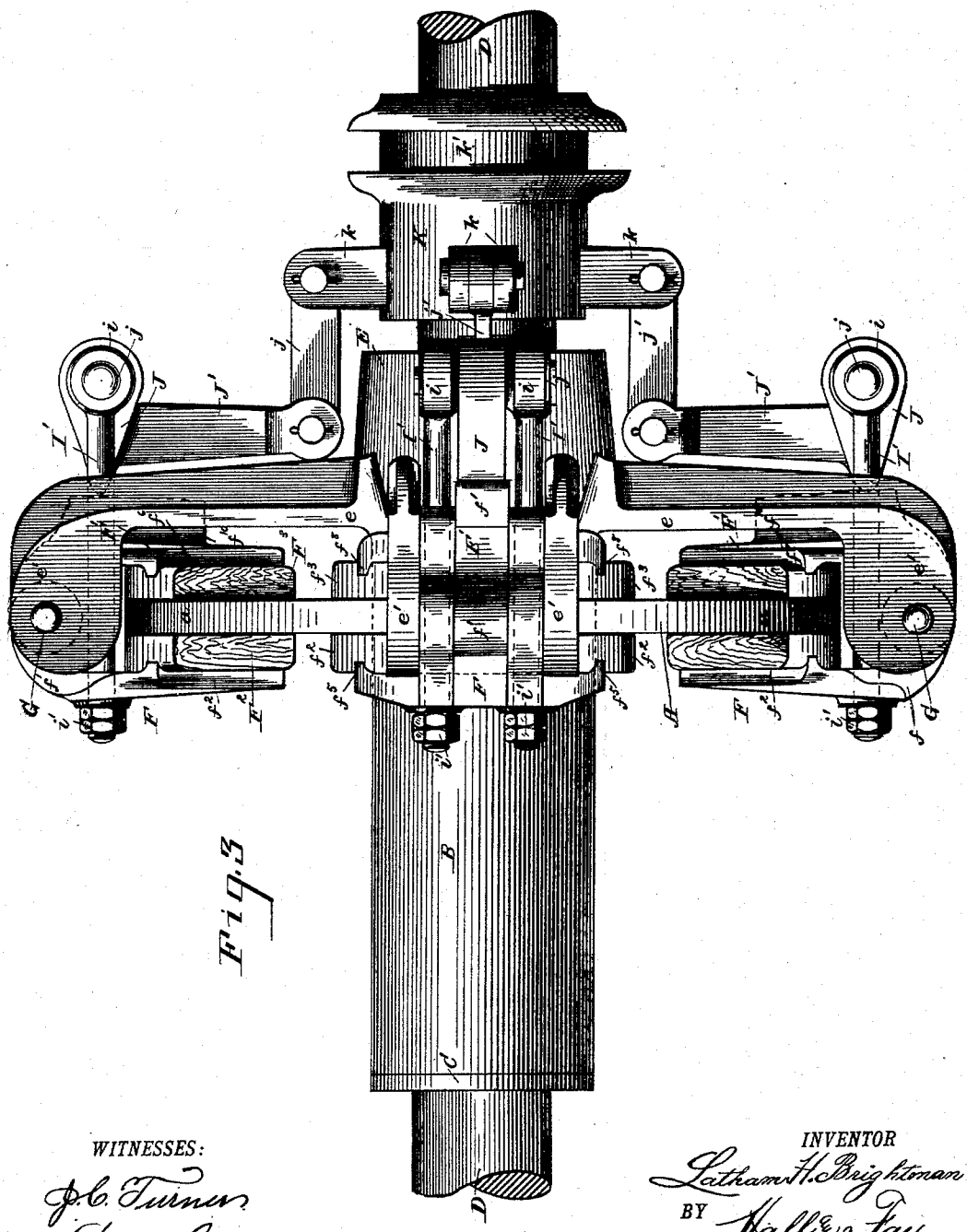


Fig. 5.

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# L. H. BRIGHTMAN.

## FRICTION CLUTCH.

No. 456,534. Patented July 21, 1891.

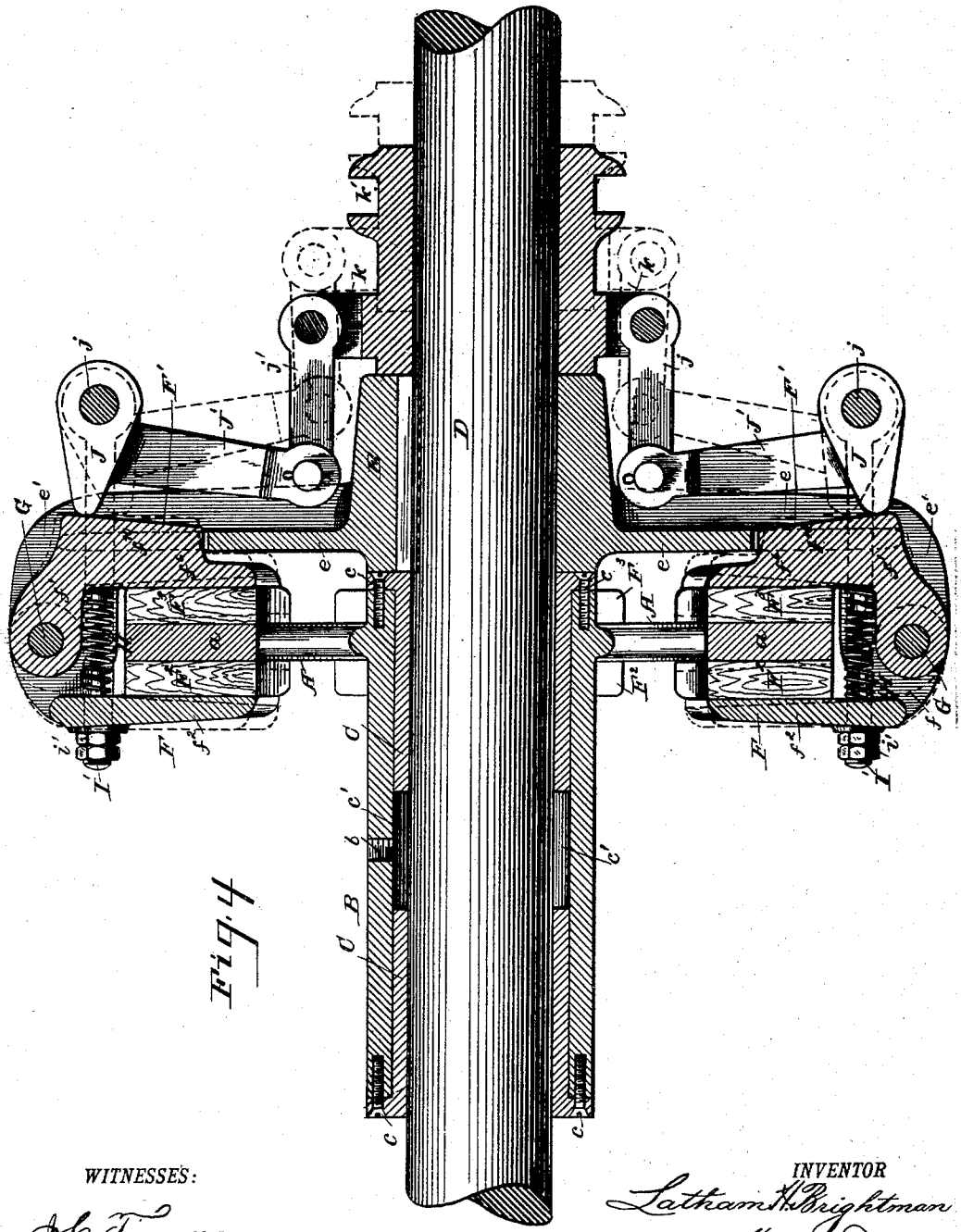


Fig. 4.

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## FRICTION CLUTCH.

No. 456,534. Patented July 21, 1891.

Fig. 5

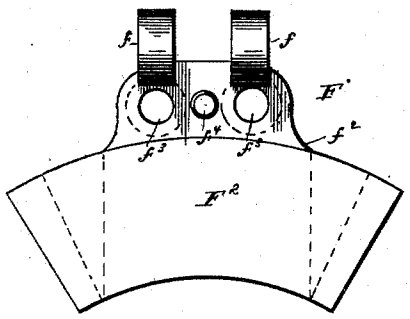



Fig. 7

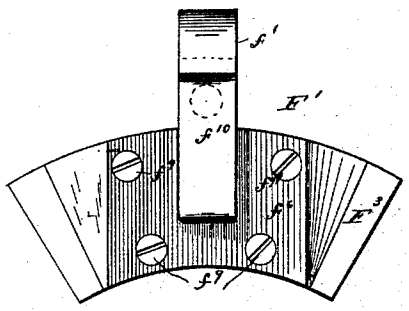



Fig. 6

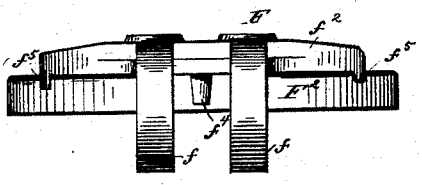



Fig. 8

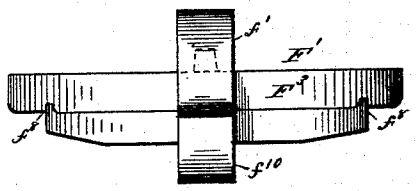
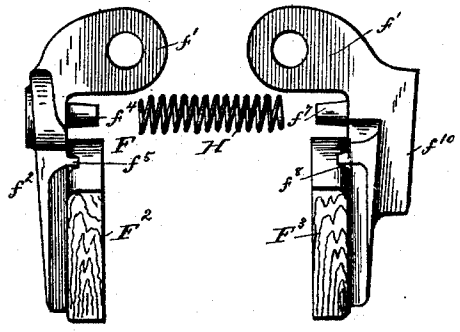



Fig. 9




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# UNITED STATES PATENT OFFICE.

LATHAM H. BRIGHTMAN, OF CLEVELAND, OHIO.

## FRICTION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 456,534, dated July 21, 1891.

Application filed December 1, 1890. Serial No. 373,143. (No model.)

*To all whom it may concern:*

Be it known that I, LATHAM H. BRIGHTMAN, a citizen of the United States, and a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Friction-Clutches, of which the following is a specification, the principles of the invention being herein explained and the best mode in which I have contemplated applying those principles so as to distinguish them from other inventions.

My invention has for its objects to provide an improved friction-clutch of simple and durable construction, to provide improved means for quickly and surely throwing the clutch into and out of engagement, to provide improved means for locking the clutch in engagement, to provide improved means for firmly clamping the member of the clutch to be revolved, to provide improved friction-surfaces for the clamps of the clutch, to provide improved means for taking up wear in the clamping parts of the clutch, and to provide improved means for fitting the loose member of the clutch upon the shaft.

Referring to the drawings, Figure 1 represents a face view of my improved friction-clutch; Fig. 2, a detail face view from the opposite side of the rim of the friction-disk and the clamping-jaw; Fig. 3, a side view of the clutch; Fig. 4, a longitudinal or axial section of the same; Fig. 5, an inside view of one of the clamping-jaws; Fig. 6, a top edge view of said jaw; Fig. 7, an outside view of the opposite clamping-jaw; Fig. 8, a top edge view of the same, and Fig. 9, a side edge view of the two jaws and their separating-spring, showing said jaws in their proper opposed positions, but detached from each other and from their pivot-bolt.

In said drawings, the letter A indicates the friction-disk or the driven part of the clutch. Said disk has, when the clutch is applied upon a continuous shaft, a sleeve B, upon which the pulley or cog-wheel to be revolved is secured, and bushings C, of brass or other suitable metal, are inserted between said sleeve and the shaft D, upon which the sleeve is journaled. Said bushings have annular flanges *c* at their ends, by means of which they are secured to the sleeve, and their united lengths are less than the length of the sleeve, so that an annular oil-chamber *c'* is formed within the sleeve and surrounding the shaft, which oil-chamber may communicate through a suitable hole *b* in the sleeve with any suitable oil-cup or lubricating device.

The friction-disk is preferably formed with a spoked center and a flat rim *a*, having parallel faces.

The driving part of the clutch consists of a spider E, secured upon the revolving shaft by a key or spline, a set-screw, or any other suitable fastening, and has radiating arms *e*, the extreme ends of which overhang the edge of the friction-disk and form perforated ears *e'*. Pairs of clamping or gripping jaws F F' are pivoted upon bolts G, which are inserted through perforated ears *f* and *f'* upon the outer edges of the jaws and through said ears *e'*, so that said jaws will straddle or hang at both sides of the friction-disk. The outer jaws F, or the jaws upon the sides at which the sleeve projects, consist each of a metal plate $f^2$, having the perforated ears *f* and having two perforations $f^3$ below said ears and a conical lug $f^4$ between said perforations. The side edges of said plate $f^2$ are formed with inwardly-projecting flanges $f^5$, which may enter the back of a flat wooden friction-block $F^2$, which is secured to said plate by means of screws and by said flanges. The inner jaws consist each of a metal plate $f^6$, having the ear *f'* upon its upper edge and having a conical lug $f^7$ below said ear. The side edges of said plate have flanges $f^8$, and a wooden friction-block $F^3$ is secured by means of said flanges, and screws $f^9$, inserted through the plate into the block. The back of said plate has a wedge-shaped rib $f^{10}$ formed upon it, increasing in height toward the upper edge. Coiled springs H are inserted between the jaws and have their ends fitted upon the conical lugs $f^4$ and $f^7$ and serve to spread the jaws from each other and from the disk. Bolts I', having eyes *i* at their ends, are inserted through holes $e^2$ in the spider-arms and through the holes $f^3$ in the outer jaw, having nuts *i'* upon their ends bearing against the outer side of said jaw. Wedge-shaped cams J have their pivots *j* pivoted in said eyes *i* and bear with their pivoted ends against the wedge-shaped ribs $f^{10}$ of the inner jaws, the spider-arms *e* having slots $e^3$, through which said ribs project.

Arms J′ project inward or toward the shaft from the inner edges of said cams, and connecting rods or arms *j′* are pivoted to the inner ends of said arms and are pivoted at their outer ends between ears *k* upon a sleeve K, which slides upon and revolves with the shaft. Said sleeve K has a peripheral groove *k′*, into which a ring, forked arm, or any other suitable shifting device may be fitted for longitudinally sliding said sleeve.

When the shifting sleeve K is moved away from the spider, the wedge-shaped cams are tilted toward the shaft and release the clamping-jaws, the springs between said jaws serving to spread them out of contact with the friction-disk. The two members of the clutch may then revolve or remain stationary independent of each other. When the shifting sleeve K is slid toward the hub of the spider, the points of the cams slide outward upon the wedge-shaped ribs of the jaws, forcing the inner jaws against the friction-disks with their points and drawing the outer jaws toward the friction-disk by means of the bolts I′. When the end of the sleeve bears against the end of the spider-hub, the ends or points of the cams will be forced beyond their dead-centers, or beyond the radius of the circle described by the cam, and to which the face of the wedge-shaped rib is the tangent. This will lock the jaws, the cams, and the shifting sleeve in position, so that no special means will be required for locking said parts in active engagement.

The clutch may be quickly and promptly operated by the sliding shifting sleeve. The wooden friction-blocks will firmly clamp the friction-disk, and when worn the wear may be taken up by tightening the nuts *i′* upon the eyed bolts until they are entirely worn out, when they may be easily replaced by new blocks.

A pulley or cog-wheel may be secured upon the sleeve of the friction-disk when the clutch is employed upon a continuous revolving shaft to impart motion to a pulley upon said shaft or to impart motion from a revolving pulley to a continuous shaft. The two parts of the clutch may also be secured upon the abutting ends of two shaft-sections for connecting or disconnecting said shaft-sections.

The friction-pulley revolves freely upon the shaft with its bushings and will leave ample oiling-space between the ends of said bushings.

The foregoing description and accompanying drawings set forth in detail mechanism embodying my invention. Change may be made therein provided the principles of construction respectively recited in the following claims are employed.

I therefore particularly point out and distinctly claim as my invention—

1. In a friction-clutch, the combination of a friction-disk, a concentric spider having radiating arms, clamping-jaws pivoted in said arms to straddle the rim of said disk, cams pivoted to bear against the jaws at one side of said disk and having inwardly-projecting arms, eyed bolts pivoted to the centers of said cams and secured with their ends to the opposite jaws, and means for tilting said inwardly-projecting arms, substantially as set forth.

2. In a friction-clutch, the combination, with a friction-disk, of a pair of jaws pivoted to straddle the rim of said disk, one of said jaws having a wedge-shaped rib upon its back, eyed bolts secured in the opposite jaw, and a wedge-shaped cam pivoted in the eyes of said bolts to bear with its pointed end against said wedge-shaped rib, substantially as set forth.

3. In a friction-clutch, the combination, with a friction-disk, of a pair of clamping-jaws pivoted to straddle the rim of said disk, eyed bolts secured to one jaw, and a wedge-shaped cam pivoted in the eyes of said bolts to bear against the back of the opposite jaw and to be locked against the same by being tilted beyond its dead-center, substantially as set forth.

4. In a friction-clutch, the combination of a friction-disk, a concentric spider having radiating arms formed with perforated ears at their outer ends, pairs of clamping-jaws having perforated ears pivoted between the ears of the spider-arms, having wooden friction-blocks secured to their inner faces, and having a wedge-shaped rib upon one of each pair of jaws, eyed bolts secured to the jaws at one side of the disk, wedge-shaped cams pivoted between the eyed bolts, bearing against the wedge-shaped ribs and having inwardly-extending arms, a sliding shifting sleeve, and connecting-rods between said sleeve and cam-arms, substantially as set forth.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 29th day of November, A. D. 1890.

LATHAM H. BRIGHTMAN.

Witnesses:
J. B. FAY,
WM. LECHER.