

No. 687,566.

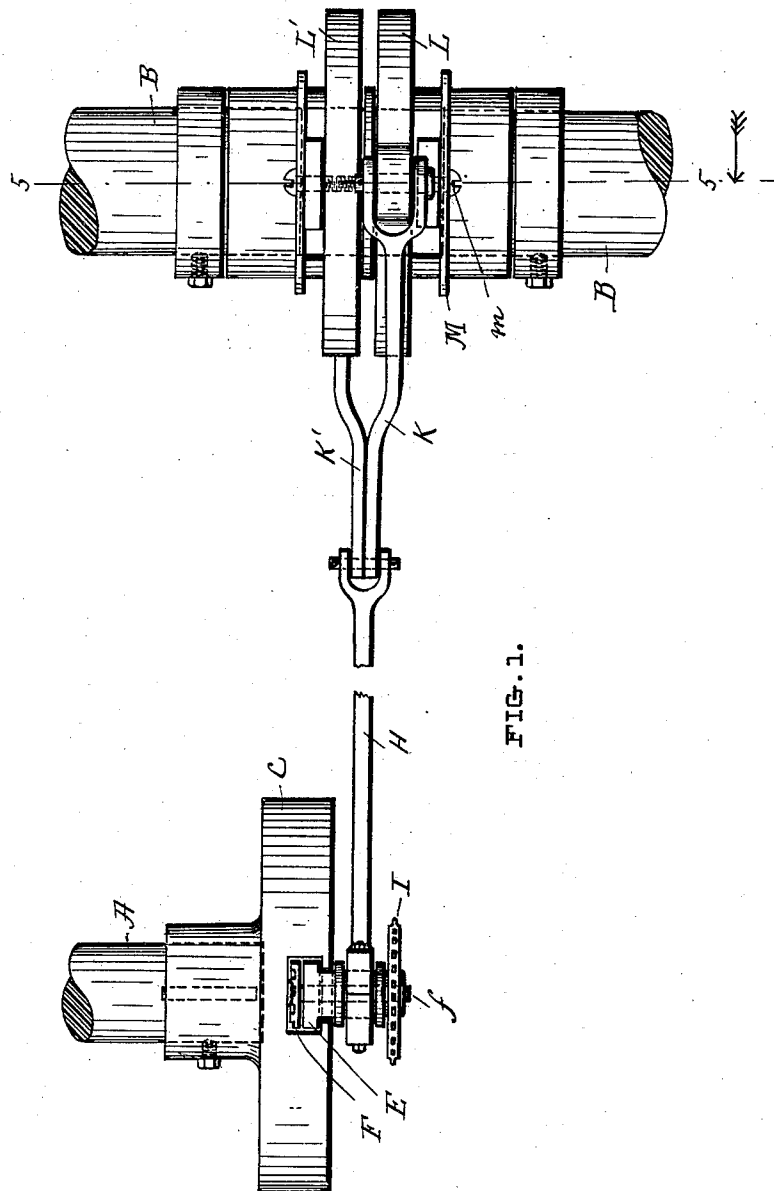
Patented Nov. 26, 1901.

C. O. JOHNSON.
SPEED CHANGING DEVICE.

(Application filed Mar. 23, 1901.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES

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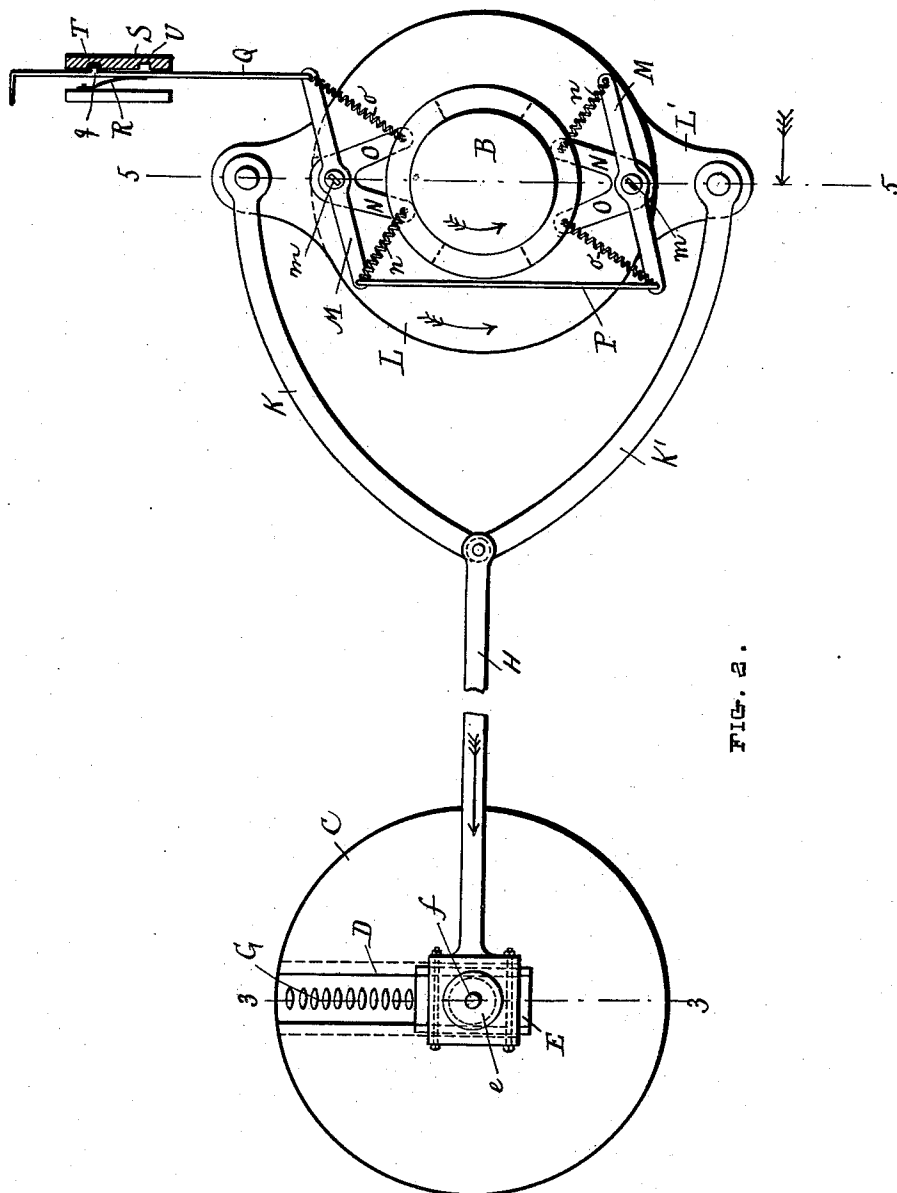
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3 Sheets—Sheet 2.



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3 Sheets—Sheet 3.

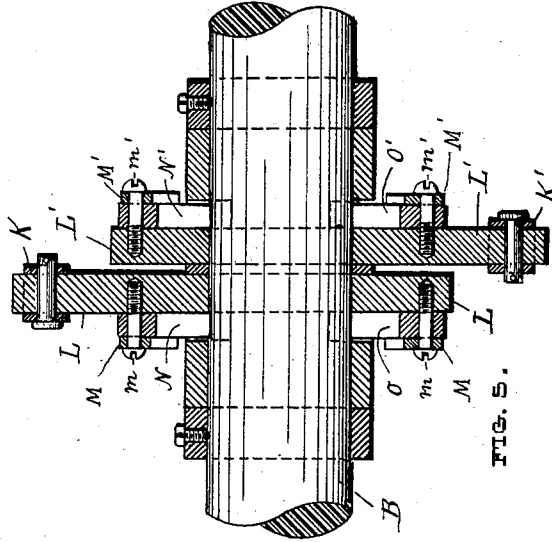


FIG. 5.

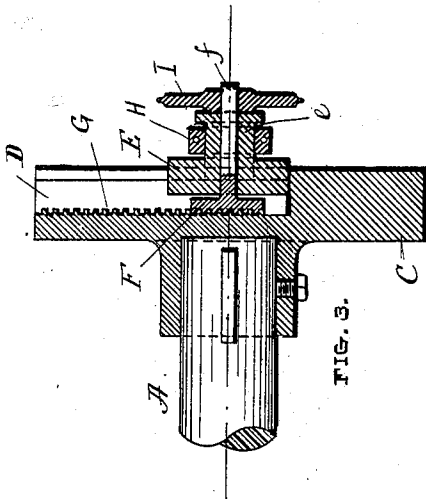


FIG. 3.

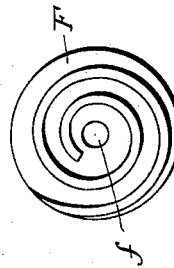


FIG. 4.

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UNITED STATES PATENT OFFICE.

CHARLES O. JOHNSON, OF BOSTON, MASSACHUSETTS.

SPEED-CHANGING DEVICE.

SPECIFICATION forming part of Letters Patent No. 687,566, dated November 26, 1901.

Application filed March 23, 1901. Serial No. 52,572. (No model.)

To all whom it may concern:

Be it known that I, CHARLES O. JOHNSON, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Speed-Changing Devices, of which the following is a specification.

This invention relates to improvements in speed-changing devices for the purpose of changing the speed of a driven shaft from a continuously-rotating driver-shaft.

The invention is carried out as follows, reference being had to the accompanying drawings, wherein—

Figure 1 represents a top plan view showing the connecting mechanism between the driving and driven shafts. Fig. 2 represents a side elevation of the same with the gear-wheel for adjusting the scroll-disk removed. Fig. 3 represents a cross-section on the line 3 3 shown in Fig. 2. Fig. 4 represents an enlarged end view of the scroll-disk; and Fig. 5 represents a longitudinal section on the line 5 5 in Figs. 1 and 2, showing the driven shaft in elevation.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

In the drawings, A represents the continuously-rotating driving-shaft of a motor or power shaft of any kind, and B represents the driven shaft, the speed of which is to be changed independent of the speed of rotation of the driving-shaft A.

To the driving-shaft A is keyed or otherwise secured the disk C, provided with a radial groove D, in which is radially adjusted and guided a block E, and in a perforation in said block is journaled a pin *f*, to the inner end of which is secured a scroll-disk F, adapted to engage with teeth or projections G G in the bottom of the groove D, as shown in Figs. 1, 2, 3, and 4. In one piece with the block E is made a sleeve *e*, on which is journaled one end of the draw-bar H, as shown. To the outer end of the pin *f* is secured, preferably, a sprocket-wheel I, which may be connected by means of a sprocket-chain and a hand-operated sprocket-wheel arranged in a convenient place at hand. Instead of a sprocket-wheel I may use a spur or bevel gear and suitable corresponding intermediate connecting

mechanism. Such connecting mechanism from the gear I is, however, not shown in the drawings, as it does not form a part of my invention and may be varied at pleasure, according to circumstances. It will be noticed that by turning said gear I the scroll-disk F will be rotated, and by its engagement with the teeth or rack G in the disk C the said scroll-disk and its shaft or pin *f* will be caused to move in a radial direction relative to the axis of the driving-shaft A for a purpose as will hereinafter be more fully shown and described.

To the end of the draw-bar H are pivotally connected a pair of rods K K', which are pivotally connected at their outer ends, respectively, to disks L L', as shown. Said disks are loosely journaled on the driven shaft B. To the disk L are secured pivot-pins *m m*, on which are pivoted levers M M, as shown. On each of said pins *m* is also loosely pivoted a forked arm N O, the ends of which are connected to the ends of the lever M by means of yielding springs *n o*, as shown in Fig. 2.

P is a rod which connects one of the ends of the levers M M, as shown in Fig. 2.

To one end of the upper lever M is attached a rod Q, having a tooth or projection *q*, adapted to be interlocked and held by a spring R in any one of the locking-recesses T U in the locking-plate S, as shown in Fig. 2, and by the adjustment of said rod Q the motion imparted to the shaft B may be reversed.

In the drawings, Figs. 1, 2, and 3, the axis of the crank-pin *f* is shown as held in a line with the axis of the driving-shaft A, and during such position the shaft A is free to rotate without imparting any motion to the draw-bar H, and consequently no motion is imparted to the shaft B.

By turning the wheel I and its shaft *f* the scroll-disk F by its engagement with the toothed rack G causes the block E to travel in a radial direction in the disk C, thus causing the pin *f* to be held more or less eccentric relative to the axis of the driving-shaft A, and when so adjusted the pin *f* causes a reciprocatory motion to be imparted to the draw-bar H.

During the motion of the draw-bar H in the direction of the arrow shown upon it in Fig. 2 the disk L is caused to be rocked in the di-

recession of the arrow shown on it in said Fig. 2, causing the ends N N of the forked arms to impinge against the shaft B by the influence of the springs o o, thereby imparting a partial rotary motion to a shaft B in the direction of the arrow shown in Fig. 2. During the opposite reciprocating motion of said draw-bar H the ends N N of the forked arms will pass freely upon the circumference of the shaft B, while corresponding portions of similar forked arms on the disk L' will impinge against the shaft B by the influence of similar springs, thus imparting a continuous rotary motion from the driving-shaft A to the driven shaft B. By adjusting the position of the rod Q a reverse motion will be imparted to the shaft B from the driving-shaft A, causing the parts O O to be intermittently clamped against the circumference of the shaft B.

The stroke of the draw-bar H and consequent speed of the shaft B can readily be adjusted simply by turning the gear I, causing the scroll-disk F, its block E, and pin f to be moved more or less from the axis of the shaft A, in which adjusted position the block E will be held by the engagement of the scroll-disk with the toothed rack G, as hereinabove described. Thus it will be seen that the speed imparted to the shaft B in either direction

from the driving-shaft A may readily be adjusted simply by turning the adjusting-wheel I. The device may also be adjusted for the purpose of holding the shaft B stationary during the rotation of the driving-shaft A.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim—

The herein-described speed-changing device, consisting in combination a disk, secured to a driving-shaft, there being a radial groove arranged in said disk, and provided with a toothed rack, a scroll-disk, meshing in said rack and journaled in a block, adjustable in said groove, a draw-bar, pivotally connected to said block, rods pivotally connected to said draw-bar, and disks loosely journaled upon the driven shaft, and reversible spring-pressed forked clamping devices pivotally connected to said disks, and means for adjusting said scroll-disk, and a reversing device, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHARLES O. JOHNSON.

Witnesses:

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RICHARD C. ULLRICH.