(No Model.)

S. P. WATT.

FRICTION CLUTCH.

No. 427,646. Patented May 13, 1890.

FIG. 1

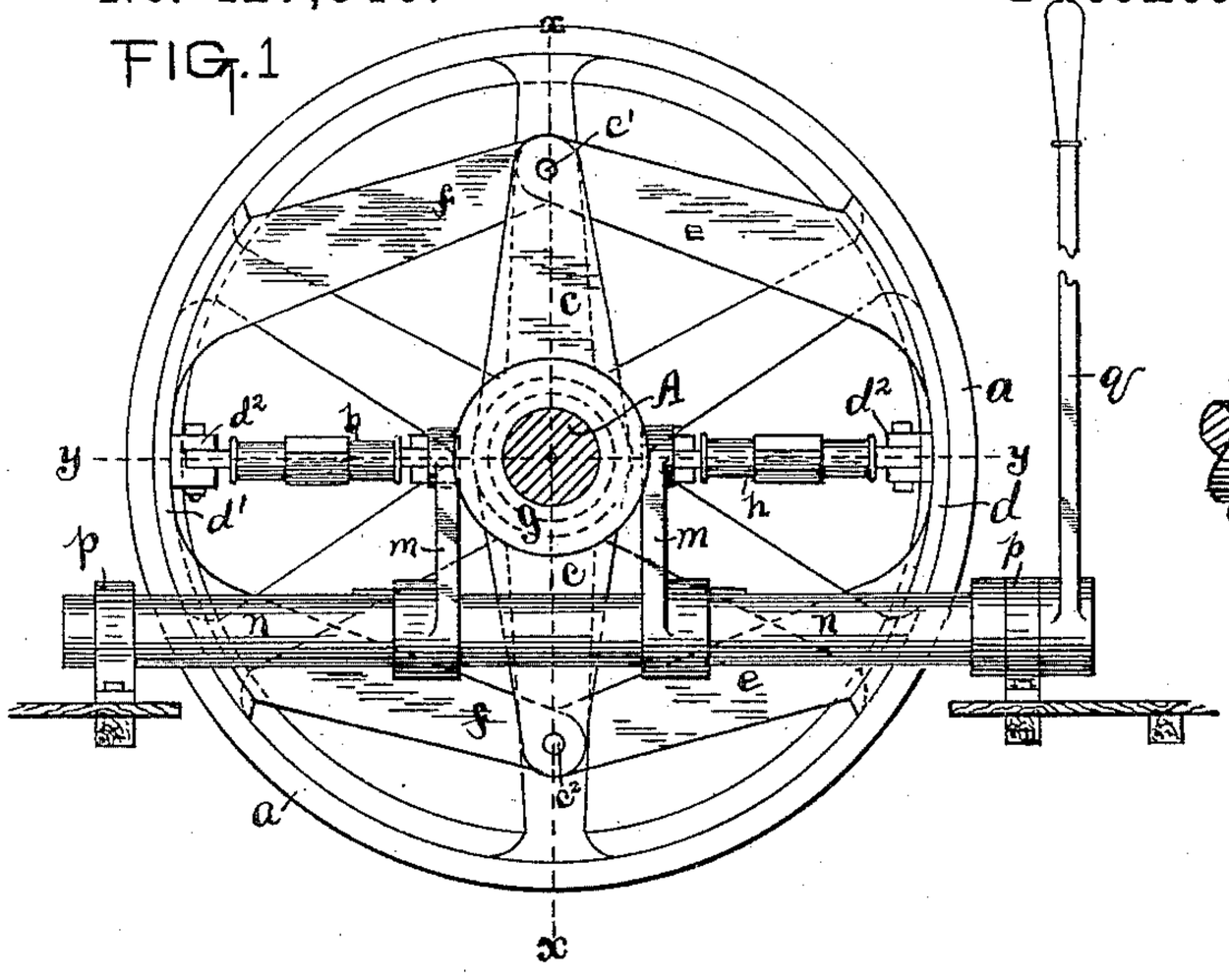


FIG 2

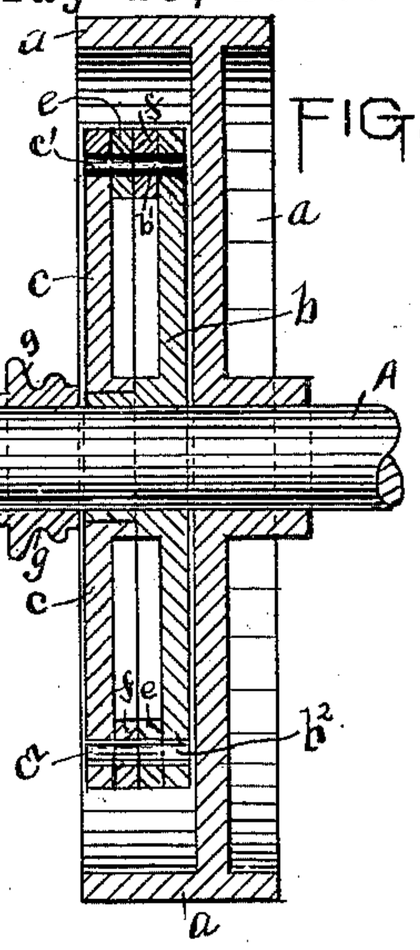


FIG 3

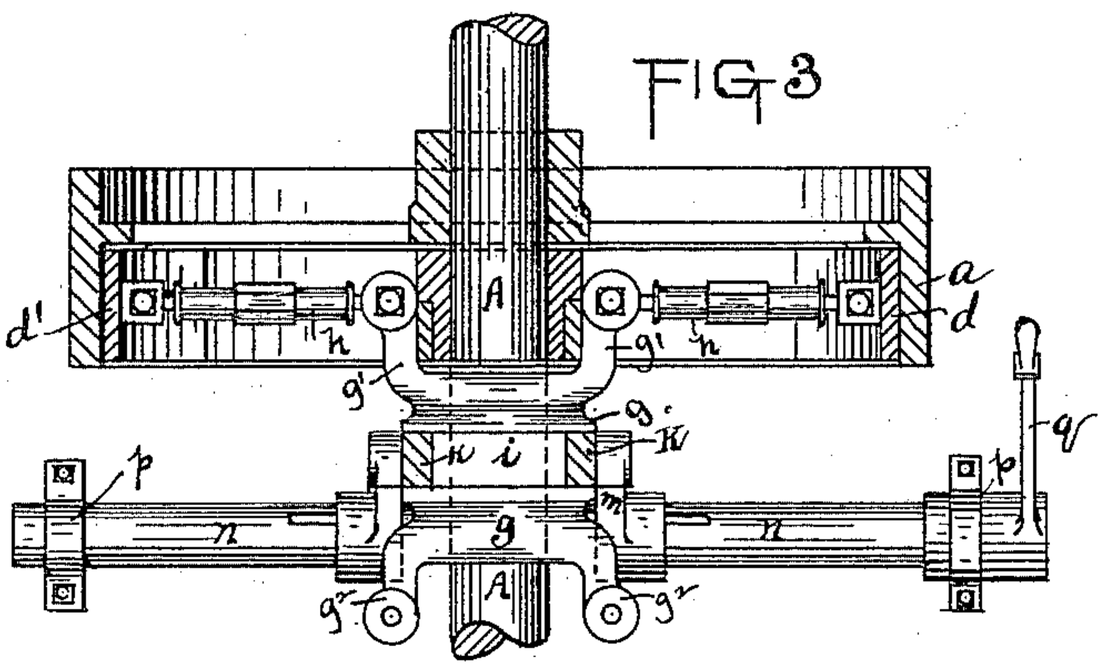


FIG 4

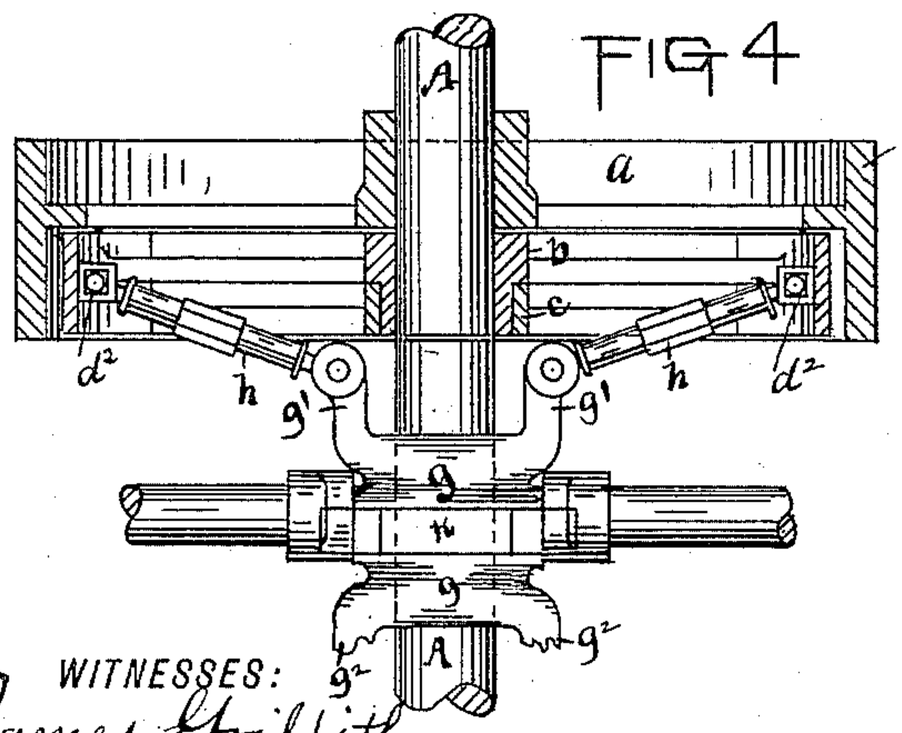


FIG. 5

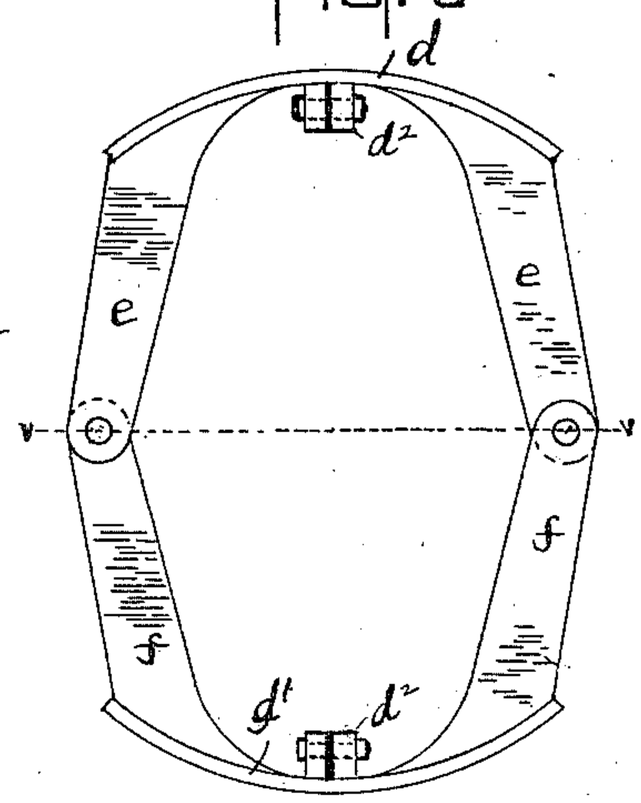
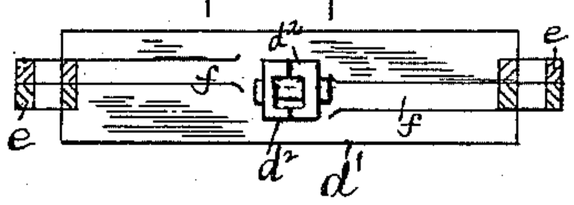


FIG 6



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FRICTION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 427,646, dated May 13, 1890.

Application filed September 2, 1889. Serial No. 322,726. (No model.)

To all whom it may concern:

Be it known that I, SERN P. WATT, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Friction-Clutches, of which the following is a specification.

My invention relates to the improvement in friction-clutches for belt-wheels of that class wherein shoes supported from the wheel-shaft are made to engage with the wheel and impart motion thereto; and the objects of my invention are to provide a device of this class of superior construction, whereby a rigid connection may be readily and easily produced between the shaft and a wheel loosely mounted thereon, to connect with the shaft fixed and movable shoe-supporting arms, and to combine therewith means for operating the shoes which will result in a parallel or corresponding motion of said shoes when the same are engaged or disengaged. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a transverse section of the shaft, showing a belt-wheel thereon, and showing the clutch-shoes in engagement with said wheel-rim. Fig. 2 is a vertical section taken on line *x x* of Fig. 1, omitting the means for operating the toggle-ring. Fig. 3 is a horizontal section taken on line *y y* of Fig. 1, showing the wheel locked on the shaft. Fig. 4 is a similar view showing the shoes disconnected from the shaft. Fig. 5 is a view in detail of the shoes, and Fig. 6 is a section taken on line *v v* of Fig. 5.

Similar letters refer to similar parts throughout the several views.

For convenience in description of my invention I will refer to that side of the wheel from which projects the hub as the rear side.

A represents a horizontal shaft, having loosely mounted thereon one or more belt-wheels *a*. Keyed or otherwise rigidly secured to the shaft A, within the rim of the wheel and on that side of the spokes opposite the hub, is the central hub of a metallic arm *b*. The fixed arm *b* is of a length somewhat less than the diameter of the wheel and has projecting forward from its respective ends short pins b' b^2. Loosely surrounding the hub of the arm *b* is the central hub of an arm *c*, corresponding in form with the arm *b*. This arm *c* has projecting rearwardly from its respective ends short pins c' c^2. These pins c' c^2 terminate in close proximity to the pins b' b^2 of the arms *b*, as shown.

d d' represent the shoes, each of which consists, as shown, of a metallic arm or plate curved to conform to the curve of the inner surface of the wheel-rim. From the inner face of each of these shoe-plates is made to extend inwardly two arms, said arms projecting, respectively, from opposite ends of said shoes.

Although the shoes d' *d* and their arms correspond in size and form, I will, for the sake of clearness of description, refer to the arms of the shoe *d* as *e* and the arms of the shoe d' as *f*.

As shown in the drawings, the shoes are located on opposite sides of the shaft, and, as hereinafter described, are made to clamp against the inner surface of the wheel-rim at opposite points.

The end of one of the shoe-arms *e* is pivotally connected, as shown, with the pin c' of the loose arm *c*. The remaining arm *e* is similarly connected with the pin b^2 of the fixed arm *b*. The end of one of the shoe-arms *f* is pivotally connected with the pin b' of the fixed arm, while the remaining arm *f* is pivotally connected with the pin c^2 of the loose arm *c*.

By the above-described connection of the shoe and shaft arms it will be seen that each shoe is connected with a fixed and loose shaft-arm, and that when said shoes are drawn inward from the wheel-rim, as hereinafter described, a parallel motion of said shoes will be attained.

g represents a clutch-ring loosely surrounding the shaft A in front of the arms *c* and *b*. This ring, as shown in the drawings, has formed therewith and projecting rearwardly from its rear end and from opposite sides thereof two short arms g', which, when the brake-shoes are in engagement with the wheel-rim, as shown in Fig. 3 of the drawings, loosely embrace the hub of the outer arm *c*. A similar pair of ring-arms g^2 may be made to extend forwardly, as shown, from the forward end of the ring, for the purpose hereinafter specified.

h h represent toggle-arms. The inner ends of these toggle-arms are, as shown, connected by a toggle-joint with the ends of the rearwardly-extending ring-arms *g'*, while their outer ends are respectively connected in a similar manner with lugs d^2, projecting inwardly from the inner faces of the shoes *d d'* at the center of the length thereof.

Formed about the center of the ring *g* is a peripheral channel or groove *i*, which forms a seat for a ring *k*, which loosely surrounds said ring *g* between the circumferential shoulders thereon formed by said groove *i*. This outer ring *k* may be formed of two connected sections, and has formed therewith and projecting therefrom at opposite points short pins, shown in dotted lines in Figs. 3 and 4. With each of these ring-pins is pivotally connected, as shown, the upper end of a short downwardly-extending operating-arm *m*. The lower end of these operating-arms *m* are rigidly connected with a horizontal operating-shaft *n*, running at right angles with and beneath the shaft A, and having suitable bearings *p*, projecting from the flooring or other frame-work. From one of the outer ends of the operating-shaft *n* extends upwardly a lever-arm *q*, as shown.

The operation of the above-described device is as follows: The brake-shoes being clamped against the inner surface of the wheel-rim, and the fixed and movable shaft-arms *b* and *c* being parallel, one in front of the other, as shown in Figs. 1 and 3 of the drawings, it will be seen that owing to the alternate connection of the shoe-arms *e* and *f* with said fixed and movable shaft-arms, as above described, a rigid connection of shaft A and the wheel-rim is formed, and the motion of the former thus communicated to the latter. The rotation of the brake-shoes with the wheel-rim will, through the toggle-arms, produce a similar rotation of the toggle-ring *g* about the shaft and within the ring *k*.

It being desired to discontinue the motion of the wheel *a* and to disconnect the rim of the same from the brake-shoes and through the latter from the shaft A, this may be readily accomplished by forcing forward the lever *q*, which through the shaft *n* and arm *m* and the connection of the latter with the ring *k* will operate to cause the ring *g* to slide forward upon the shaft A. This forward movement of the ring *g* will, as shown in Fig. 4 of the drawings, operate to draw forward the inner ends of the toggle-arms, which movement will result in the inward movement of the shoes *d d'*, thus releasing the latter from the rim of the wheel.

The above-mentioned inward movement of the brake-shoes, owing to the herein-described connection of one of the arms of each of the shoes with the fixed shaft-arm and the connection of the remaining shoe-arm with the loose shaft-arm, as will be seen, will operate to produce a slight motion of the loose shaft-arm *c*.

As shown in the drawings hereinbefore mentioned, the ring *g* may be provided at its forward end with a second pair of arms g^2, which, if desired, may be made to operate a second pair of toggle arms and shoes in connection with a second belt-wheel loosely mounted on shaft A, as described, for the wheel *a*.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a friction-clutch and the means for operating the same, the combination, with a wheel loosely mounted on shaft A, of arm *b*, fixed on said shaft, arm *c*, loosely mounted thereon, brake-shoes *d d'*, each having a pair of arms pivotally connected, respectively, with the fixed and loose arms *b* and *c*, substantially as and for the purpose set forth.

2. In a friction-clutch, the combination, with a wheel *a*, loosely mounted on shaft A, of fixed shaft-arm *b*, and loose shaft-arm *c*, mounted on shaft A, brake-shoes *d d'*, each having a pair of arms pivotally connected, respectively, with said loose and fixed shaft-arms, ring *g*, having arms *g'* and toggle-arms *h* connecting, as described, ring *g'* and brake-shoes *d d'*, substantially as and for the purpose specified.

SERN P. WATT.

In presence of—
BARTON GRIFFITH,
R. M. WEAVER.