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Patented May 22, 1900.

G. S. EMERICK.

FRICION AND POSITIVE CLUTCH.

(Application filed Aug. 23, 1899.)

(No Model.)

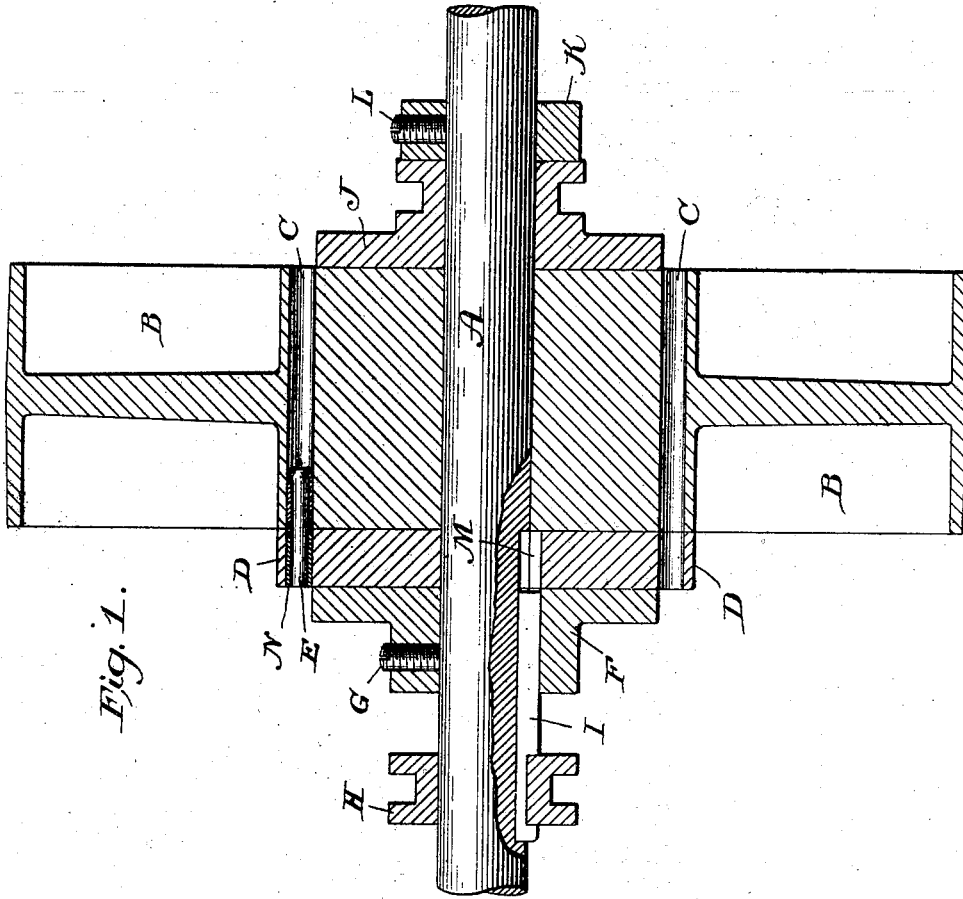


Fig. 1.

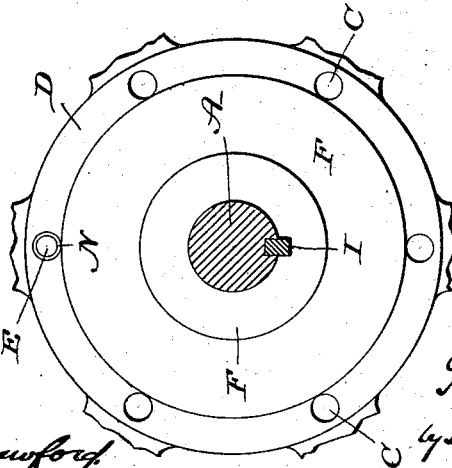


Fig. 2.

Witnesses.

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FRICITION AND POSITIVE CLUTCH.

SPECIFICATION forming part of Letters Patent No. 650,106, dated May 22, 1900.

Application filed August 23, 1899. Serial No. 728,194. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. EMERICK, a citizen of the United States, residing at No. 1927 Ontario street, in the city and county of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Frictional and Positive Clutches, of which the following is a specification.

My invention relates to that class of clutches wherein the rotation of the power-shaft is communicated to the pulley-wheel by a positive clutch, the pulley-wheel being set in motion and raised to the speed of the power-shaft by the application of a friction-clutch; and the object of my invention is to remedy a defect hitherto existing in clutches of this description by providing a means whereby the pins of the positive clutch can when broken be removed from the clutch and from the hub of the pulley-wheel and new pins inserted without interference with the rotation of the power-shaft. I attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of the entire clutch and of the pulley-wheel to which it is applied, both being mounted upon the power-shaft. Fig. 2 is an end view of the clutch.

In Fig. 1, B is a pulley-wheel hanging unattached on the power-shaft A, its hub being perforated by the opening C, which may be either circular in form, as shown in Fig. 2, or of any other suitable shape, passing entirely through the hub.

D is a clutch-collar hanging on the power-shaft A and carrying the frangible pins E, which engage the hub of the pulley-wheel B, as shown in Fig. 1. These pins fit firmly into their sockets in the clutch-collar D and into the openings C in the pulley-wheel hub.

J is a friction-collar hanging on the power-shaft.

F and K are fixed collars attached to the power-shaft A by the set-screws G and L, maintaining the pulley-wheel B, clutch-collar D, and friction-collar J in position on the power-shaft.

H is a clutch-collar rotating with the power-shaft A and actuated by any suitable form of lever to slide thereon by means of the key I, which is carried by the clutch-collar H and slides in a key-seat located partly in the

power-shaft and partly in the fixed collar F and clutch-collar D and passing through the latter to the face of the pulley-wheel hub. A portion of this key-seat where it passes through the clutch-collar D is shown at M.

The operation of the clutch is as follows: The clutch-collar H, with its key I, being drawn back upon the power-shaft, as shown in Fig. 1, the pulley-wheel B and clutch-collar D, connected by the frangible pins E, hang motionless upon the rotating power-shaft. To apply the clutch, the friction-collar J, actuated by any suitable form of lever, is pressed against the hub of the pulley-wheel B, thus bringing the clutch-collar D into frictional contact with the fixed collar F, which is attached to and rotating with the power-shaft. When this frictional contact has raised the speed of the clutch-collar D and pulley-wheel B to the speed of the power-shaft A, the clutch-collar H, with its key I, is moved forward, the key I passing into the key-seat M in the clutch-collar D. (Shown in Fig. 1.) Should the head of the key I not immediately meet and enter the key-seat M in the clutch-collar D, the requisite adjustment of parts can readily be effected by slightly slackening the pressure of the friction-collar J upon the pulley-wheel hub. This will diminish the speed of the latter and of the clutch-collar D, whereby the key-seat M in the clutch-collar D can be brought into the requisite position. When the key I enters the key-seat in the clutch-collar D, a positive clutch is thereby established upon the latter and thence through the medium of the frangible pins E upon the pulley-wheel B. It will be observed that the key-seat M does not extend into the hub of the pulley-wheel and that when the positive clutch is established the transmission of rotation from the power-shaft A is, first, by the clutch-collar H and key I to the clutch-collar D, and, secondly, by the frangible pins E of the latter to the pulley-wheel B. Consequently should there occur a break or stoppage of the machinery driven by the pulley-wheel the frangible pins E give way without further injury to the clutch mechanism, since as soon as the positive clutch is established the friction-clutch, which is employed to raise the speed of the pulley-wheel in the first instance and to effect the requi-

site adjustment of parts for the application of the positive clutch, should be thrown off. Upon the breaking of the pins the clutch-collar H and key I are withdrawn into the position shown in Fig. 1, and the clutch-collar D and pulley-wheel B come to rest upon the shaft. The broken halves of the pins can then be drifted or driven out through the openings C from the opposite side of the pulley-wheel hub and new pins inserted without in any manner interfering with the rotation of the power-shaft.

The clutch can be adjusted to a predetermined breaking strain by varying either the number or the size of the pins. They may be of any suitable material. If of wood, they may be sheathed with metal, as shown at N, Fig. 1, in order that they may be the more readily driven out or inserted. Such sheathing, if used, should not cross the line of contact between the clutch-collar D and the pulley-wheel hub in order not to interfere with the frangibility of the pins.

I have shown and described but a single key I, carried by the clutch-collar H, to establish a positive clutch upon the clutch-collar D; but I do not confine myself to a single key or bolt, as a plurality thereof may be carried by the clutch-collar H to perform a like function.

I am aware that there exist clutch mechanisms wherein rotation obtained by the application of a friction-clutch is maintained by a positive pin-clutch which engages the pulley-wheel hub, and I am also aware that frangible pins have been employed in clutch mechanisms. I therefore do not claim such combinations broadly.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the shaft, the loose pulley provided with openings, the clutch-collar provided with frangible pins and a key-seat, and a key slidable on said shaft to engage the clutch-collar.

2. The combination of the shaft, the loose pulley provided with openings, the clutch-collar provided with frangible pins and a key-seat, a key slidable on said shaft to engage the clutch-collar, a fixed collar at one side of the pulley, and a friction-collar at the opposite side thereof, the rotation of the shaft being communicated by the key to the clutch-collar and by the clutch-collar to the pulley, substantially as described.

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Witnesses:

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