No. 750,944. PATENTED FEB. 2, 1904.

J. H. B. BRYAN.

FRICTION CLUTCH.

APPLICATION FILED NOV. 27, 1903.

NO MODEL.

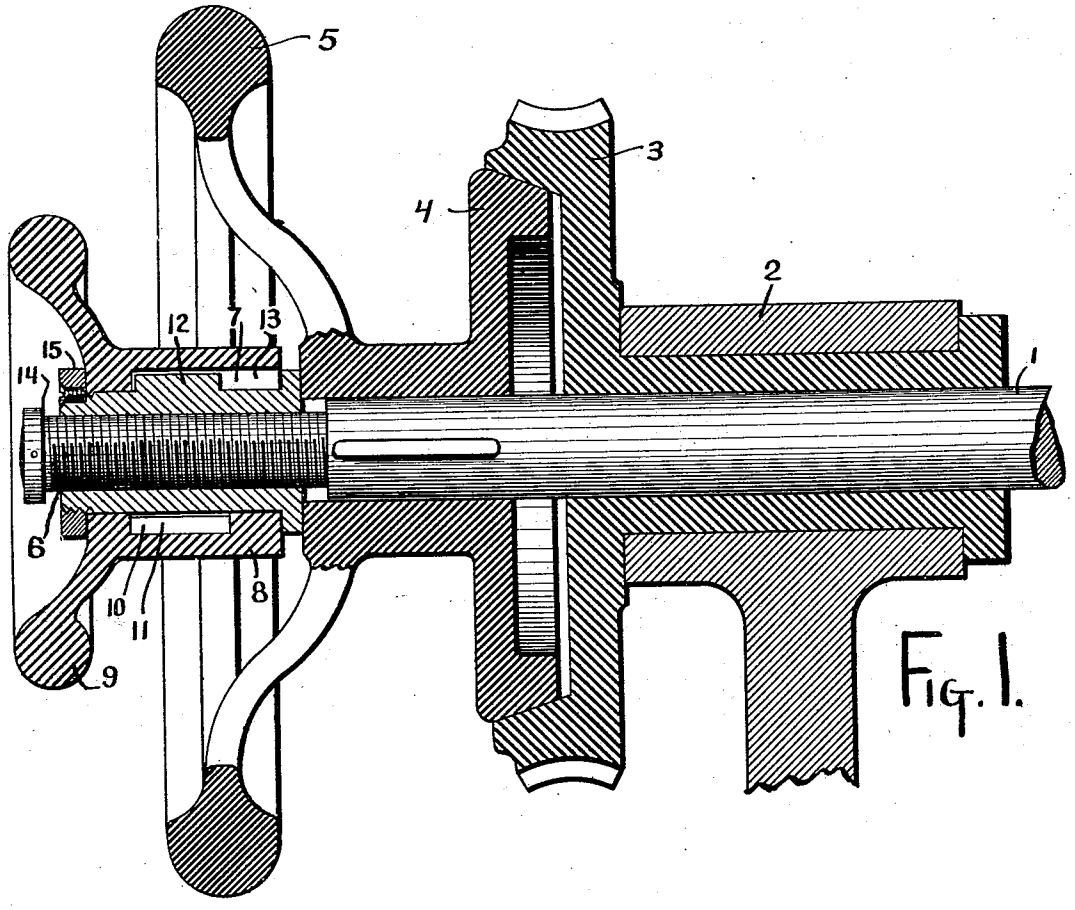


FIG. 1.

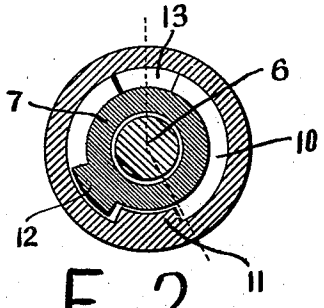


FIG. 2.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 750,944. Patented February 2, 1904.

UNITED STATES PATENT OFFICE.

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FRICTION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 750,944, dated February 2, 1904.

Application filed November 27, 1903. Serial No. 182,721. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. B. BRYAN, a citizen of the United States, residing at Buffalo, Erie county, New York, (post-office address, Buffalo, New York,) have invented certain new and useful Improvements in Friction-Clutches, of which the following is a specification.

This invention pertaining to improvements in friction-clutches will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a diametrical section of a friction-clutch exemplifying my invention, and Fig. 2 a transverse section thereof.

It is very common in machinery, especially in machine-tools, to provide a feed-shaft with a handle, permitting the shaft to be turned by hand in a hand-feeding operation, and to have a power-driven gear loose on the shaft and to be frictionally clutched thereto when the feeding is to be done by power. The friction-clutch thus employed in locking the power-driven wheel to the shaft is generally thrown into action by means of a handled nut serving as a clamp or binder, and the friction-clutch has generally consisted of coöperating cones or disks engaging by friction when set up by the binder. When heavy feeding work is being done by power, the friction-clutch is often inclined to slip, and it is not uncommon for workmen to increase the tight setting of the clutch-binder by employing a hammer or a hammer and set to tighten up the binder-nut. Again, the friction-clutch occasionally gets such a tight grip that the workman is unable with his hand to loosen the binder, and again he calls into play the hammer or other appliance, and it is very usual to find the binders of such devices mutilated most shamefully by the use of tools employed in operating binders intended to be operated by the grip of the hand alone. In my improved construction I arrange the handle of the binder with such a degree of lost motion that it may have its motion installed before it begins to do work, the momentum thus developed in the handle serving in setting or releasing the binder by impactive action.

In the drawings, 1 indicates a portion of the shaft of a machine—a feed-shaft, for instance—which is to be turned by hand or by power at will; 2, a bearing for the shaft; 3, a gear loose on the shaft and constituting the power-driven element of the systom, this gear being illustrated as a worm-gear adapted to receive power from any suitable driven worm, this worm-gear having a frusto-conical counterbore in its face; 4, a friction-disk splined on the shaft and adapted to frictionally engage the counterbore of the worm-gear; 5, a hand-wheel fast with the friction-disk, this hand-wheel constituting the hand-feeding handle by which the shaft may be readily turned by hand when the friction-disk is not locked to the worm-gear; 6, a thread upon the end of the shaft; 7, a nut upon the threaded portion of the shaft and engaging exterior to the friction-disk and serving when turned to lock the friction-disk to the worm-gear or to release it therefrom.

The parts thus far referred to will be recognized, if a handle be assumed upon nut 7, as the usual organization employed about machine-tools arranged for hand and power feeding. As thus far considered and assuming a solid handle of some kind upon nut 7, the user would be confronted with the difficulties heretofore referred to—that is to say, he might not be able without hammering on the handle of the nut to tighten up the friction sufficient and it having been tightened up even by hand he might not be able without hammering on the handle to release the friction—and it is these difficulties my invention seeks to and does overcome.

Proceeding with the drawings, 8 indicates a hub turning loosely on nut 7; 9, a hand-wheel fast with this hub and serving as the handle by means of which the nut is to be turned in locking and releasing the friction parts; 10, an annular enlargement of the bore of hub 8; 11, a lug projecting inwardly from the peripheral wall of the enlarged bore 10 of the hub; 12, a lug projecting outwardly from

the nut within the enlarged bore 10 and adapted as hub 8 is turned one way or the other to make contact with lug 11 after the hub has been turned through a part rotation; 13, a gap in the inner wall of the enlarged bore of hub 8 to permit of the hub being passed endwise of the nut in the act of assembling the parts, so as to get lug 12 within the enlarged bore of the hub; 14, a stop-collar on the outer end of screw 6 to limit the retreat of nut 7, such stop-collar being usually found in devices of this general class, and 15 a collar upon the outer end of nut 7 to hold hub 8 against endwise displacement therefrom.

In using this device when the friction-disk is to be engaged with the worm-gear hand-wheel 9 is turned in the usual manner, resulting in screwing up nut 7 and forcing the friction-disk into engagement. Should the friction-disk slip by reason of inefficient binding, it can be tightly set by turning hand-wheel 9 backward more or less and then readvancing it with a quick motion, so as to develop momentum in it, the result being that lug 11 strikes against lug 12 with impactive force and sets the friction tightly. The friction is released by a similar operation in case the simple steady turning of hand-wheel 9 will not release the nut—that is to say, the hand-wheel is turned ahead and then retreated quickly, so as to impart a blow to lug 12.

I claim as my invention—

1. In a friction-clutch, the combination, substantially as set forth, of two rotary members to engage by friction, a nut working upon a screw and serving to force said friction members together, a handle mounted for rotation relative to said nut, and coöperative lugs upon the nut and handle to cause the handle to impart rotation to the nut after moving idly relative to the nut.

2. In a friction-clutch, the combination, substantially as set forth, of a shaft, a gear loose thereon and provided with a friction-surface, a friction-disk splined to the shaft, a handle fast with the friction-disk, a nut screwed upon the shaft and serving to force the friction-disk into frictional engagement with the gear, a handle mounted to turn upon the nut, and coöperating lugs upon the handle and nut.

3. In a friction-clutch, the combination, substantially as set forth, of a shaft, a gear loose thereon and provided with a friction-surface, a friction-disk splined to the shaft, a handle fast with the friction-disk, a nut screwed upon the shaft and serving to clamp the friction-disk to the gear, a lug projecting outwardly from the surface of the nut, a hub mounted for rotation upon the nut and having its bore annularly enlarged to receive said lug, a lug projecting inwardly from the enlarged bore of the hub in the path of the first-mentioned lug, and a handle fast with said hub.

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