No. 821,680. PATENTED MAY 29, 1906.

G. E. TURNER.

FRICTION CLUTCH.

APPLICATION FILED JULY 30, 1904.

2 SHEETS—SHEET 1.

Fig. 2.

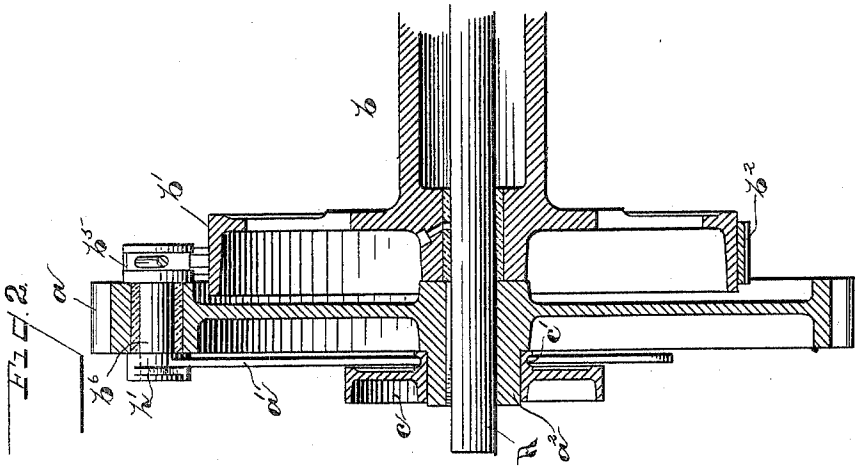
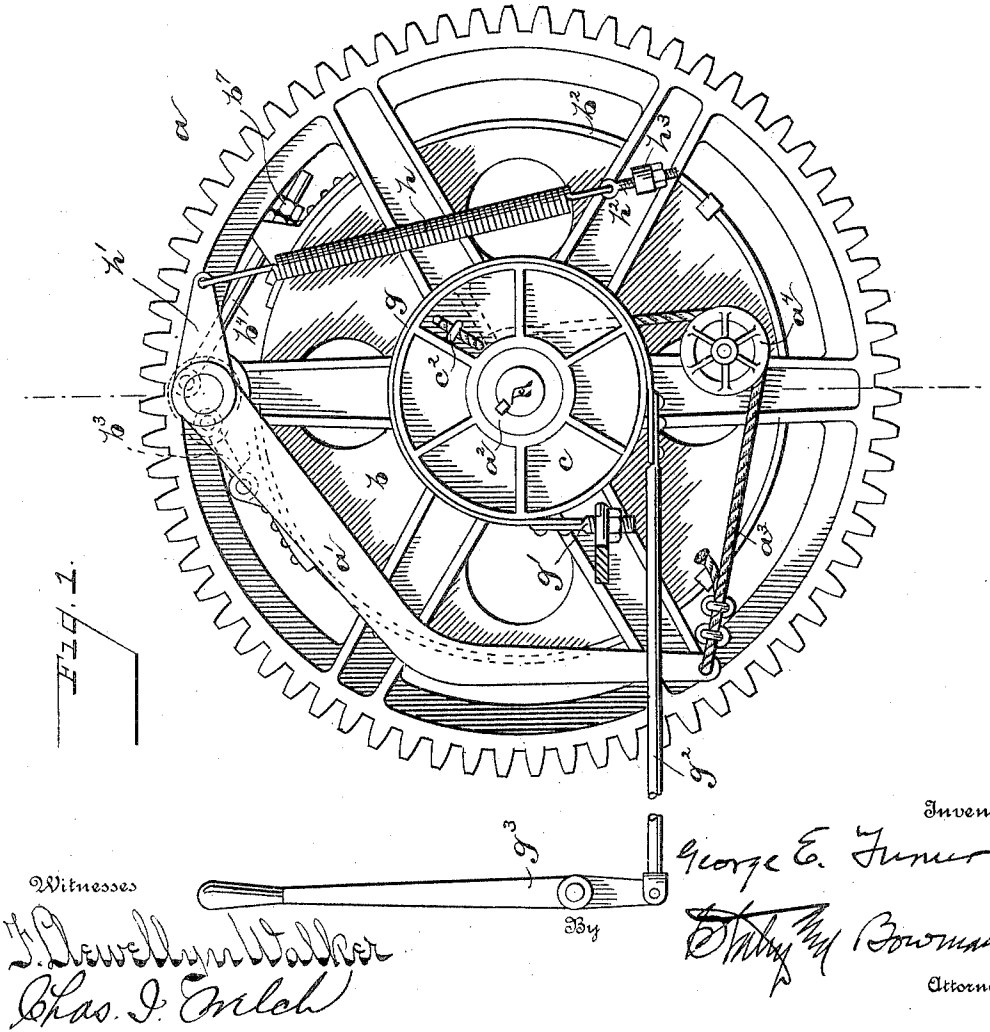


Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 3

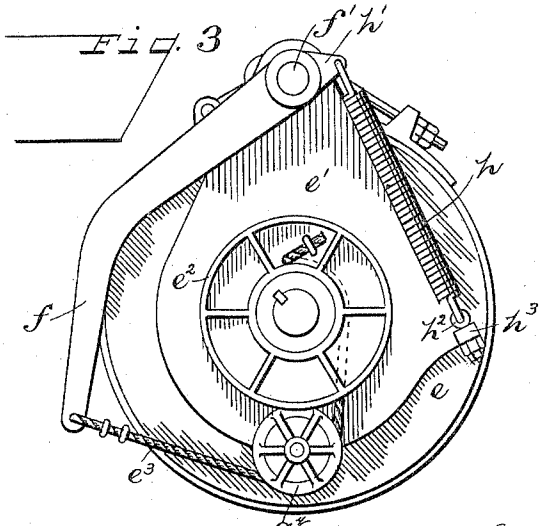


Fig. 5

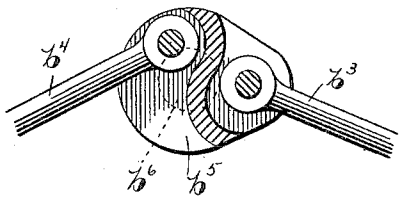
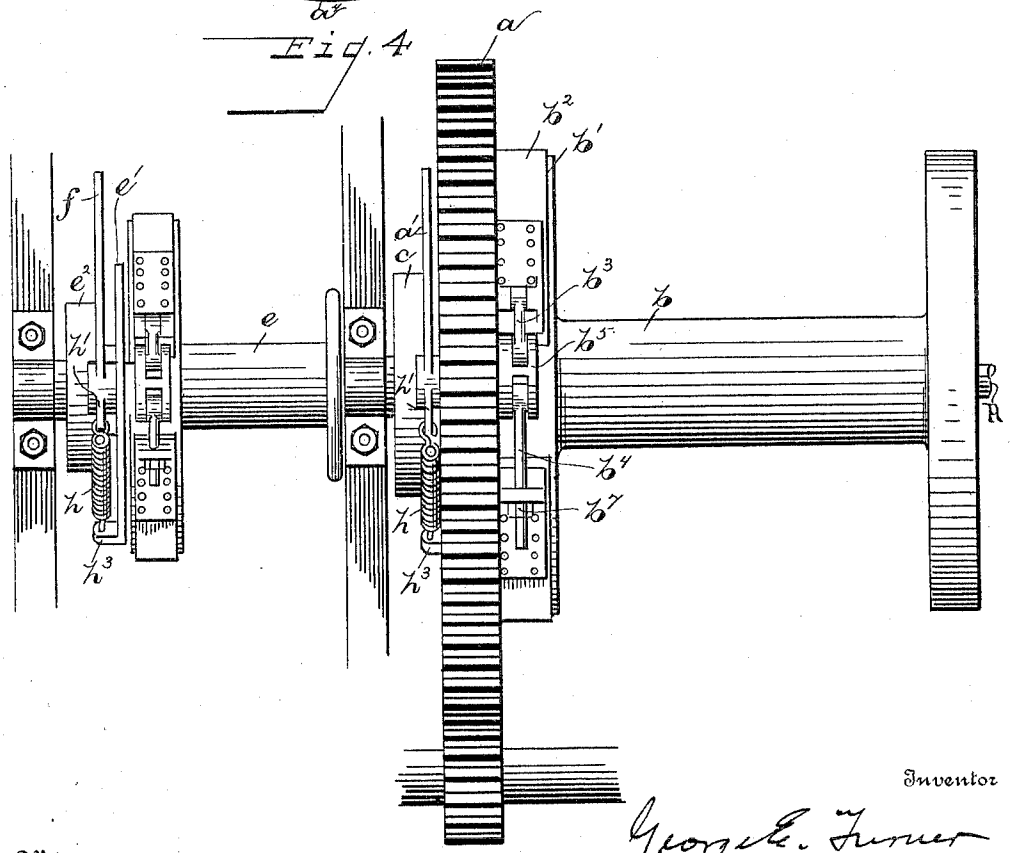


Fig. 4



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FRICTION-CLUTCH.

No. 821,680. Specification of Letters Patent. Patented May 29, 1906.

Application filed July 30, 1904. Serial No. 218,811.

To all whom it may concern:

Be it known that I, GEORGE E. TURNER, a citizen of the United States, residing at Bellefontaine, in the county of Logan and State of Ohio, have invented certain new and useful Improvements in Friction-Clutches, of which the following is a specification.

My invention relates to friction-clutches, and particularly to those of the strap or brake-band type.

The object of my invention is to provide improved means for establishing operative connection between a rotating shaft and a drum, a wheel or other rotatable body loosely mounted on said shaft, and, further, to provide means whereby the driving power may be utilized to tighten the strap or brake-band at the will of the operator and so arrange the leverage that this may be accomplished by the application of a comparatively small amount of power through a hand-lever.

A further object of my invention is to greatly simplify the construction as well as the means and mode of operation of such devices, whereby they are not only cheapened in construction, but are rendered unlikely to get out of order and are made easy of operation.

With the above primary and other incidental objects in view my invention consists of the constructions, combinations of parts, and mode of operation hereinafter described, and set forth in the claims.

In the drawings, Figure 1 is a side elevation of the clutch mechanism and operating parts mounted on the power-transmission gear. Fig. 2 is a longitudinal sectional view of same. Fig. 3 is a view of mechanism applied to a driving-arm employed when duplicating the parts upon the same shaft. Fig. 4 is a plan view showing two drums and two sets of clutch mechanism mounted on the same shaft and driven from the same source. Fig. 5 is a detail of the eccentric connection for the ends of the brake-band.

In the said drawings, a is a gear-wheel mounted on a shaft A and driven through suitable means from the engine. Loosely mounted on the shaft A is a drum b, which is to be intermittently driven in one direction. The end of the drum b adjacent to the gear a is provided with a peripheral face, forming integrally with said drum a band-wheel b'. Around the band-wheel b' extends a strap or brake-band b^2. To each end of the strap b^2 there is connected a link b^3 b^4, and these links are pivotally secured to the head b^5 of a rock-shaft b^6 in such position that the points of connection are eccentric to said shaft. The link b^4 is preferably screw-threaded and equipped with adjusting-nuts, as shown at b^7. To the opposite end of the shaft b^6 is secured a curved lever a'. By operating the controlling-lever a' as hereinafter described the shaft b^6 will be rocked and the respective ends of the strap b^2 will be carried in opposite directions through the eccentric connection of the links b^3 b^4 with said shaft b^6, and thereby tighten or loosen the strap b^2 upon the band-wheel b', according to the direction in which said lever is moved, the tightening power being thus applied simultaneously to both ends of the strap b^2.

The hub of the gear-wheel a is extended, as at a^2, on the side opposite the drum b to form a bearing for a friction-disk c, loosely mounted on said hub extension. The friction-disk c has an inwardly-extending hub c', forming a drum or reel for the rope, chain, or other flexible connection a^3, one end of which is connected with the lever a' and the opposite end with the friction-disk c, as shown at c^2. While the friction-disk, as has been stated, is loosely mounted on the hub a^2, it normally travels with the gear a on account of the flexible connection a^3, but is capable of movement independent of said gear a. As long as the gear a and friction-disk rotate at the same speed the lever a' and strap b^2 will remain unaffected; but if the rotation of the friction-disk be retarded while the gear a continues to rotate at the usual speed the result will be that the flexible connection a^3 will be wrapped partially around the hub c', thereby pulling the lever a' toward the friction-disk c and rocking the shaft b^6 to tighten the strap b^2 upon the band-wheel b', as hereinbefore described. If the lever a' was formed straight, only a small movement of said lever would be permitted before it would interfere with the friction-disk c. Therefore the lever a' is preferably formed curved, as illustrated in Figs. 1 and 3, and in order that the lever a' may be of the greatest possible length consistent with the diameter of the gear a, thus giving the greatest possible leverage, and in order that pull of the flexible connection a^3

may be at substantially right angles to said lever the connection a^3 is passed over the idler-pulley a^4 intermediate of its connections with the friction-disk c and the lever a', as shown in Figs. 1 and 3. If but a single drum is to be driven by means of the gear a, the gear may be loosely mounted on the shaft A and said shaft may be stationary. If, however, several drums or other mechanism are to be driven through the medium of said gear, then the gear must be keyed or otherwise secured to the shaft, as illustrated in the drawings, whereby said shaft will rotate with the gear.

Referring to Sheet 2, Figs. 3 and 4, there is illustrated mechanism whereby more than one drum on the shaft can be driven from the same transmission-gear. In Fig. 4 in addition to the drum b and the transmission-gear a and attached clutch mechanism, as hereinbefore described, there is also loosely mounted on the shaft a drum e and adjacent thereto rigidly attached to the shaft A a driving-arm e', Fig. 3. A friction-disk e^2, similar to disk c, is mounted on the extended hub of the driving-arm e and through a flexible connection e^3 operates a lever f on the rock-shaft f', mounted in said driving-arm, to tighten the strap or brake-band upon its corresponding drum in the same manner as in the construction hereinbefore described.

It will be understood that in a series of drums and clutches it is not necessary that one set shall be mounted on the transmission-gear, as illustrated in Fig. 4; but all may be of the form shown in Fig. 3 and the transmission-gear located elsewhere on the shaft. However, for simplicity and economy in manufacture and to reduce the necessary number of parts the form illustrated in Fig. 1 is preferred.

To retard the rotation of the friction-disks c and e^2, any suitable brake mechanism may be employed. In Fig. 1 a simple and preferable form is shown, which consists of a brake-band g, attached at one end by suitable means to the supporting-frame, as at g', and the opposite end connected by a link g^2 to a hand-lever g^3. To return the parts to normal position and disengage the mechanism upon the release of the brake-band g on the friction-disks c and e^2, there is employed a helical spring h, one end of which is connected with a short arm h' of the curved lever, and the opposite end is connected by an eyebolt h^2 with a lug h^3 on the driving member.

It will be seen that by the constructions hereinbefore described I provide a power-transmission device which is simple and efficient in use and economical in manufacture. The device described is of especial value in driving the various drums and reels of steam dredge-boats, steam-shovels, and hoisting devices and has been described and illustrated in connection with such devices; but it is to be understood that such reference is merely incidental to the description, and the invention is not to be limited to its application with such devices, but is applicable to mechanism of various sorts.

Having thus described my invention, I claim—

1. The combination of a shaft, a driving member on said shaft, a rotatable body formed with a friction-surface, a friction-band to engage said surface, an operating-lever mounted in said driving member and adapted upon oscillation to operate said friction-band, a projecting hub on said driving member forming a bearing for a drum or reel, a drum journaled on said projecting hub, a flexible connection between said drum and said lever whereby the line of force as applied through said flexible connection will be substantially tangent to the path of travel of the point of application to said lever, and means to revolubly change the relation of said drum and driving member to tighten said flexible member, substantially as specified.

2. The combination with a shaft, of a driving member thereon, a driven member, a friction-band, a lever mounted on the driving member, and of a length greater than the radius thereof, said lever being adapted upon oscillation to operate said friction-band, a drum adjacent to said driving member, a pulley on said driving member and substantially diametrically opposite the fulcrum of said lever, a flexible connection passing about said pulley and connecting said drum and lever, and means for varying the relative speed of said drum and driving member to cause a revoluble movement of said drum in relation with said driving member, substantially as specified.

In testimony whereof I have hereunto set my hand this 21st day of July, A. D. 1904.

GEORGE E. TURNER.

Witnesses:

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KARL S. KUMLER.