(No Model.)

J. CLARK.

FRICTION CLUTCH.

No. 432,600. Patented July 22, 1890.

Fig. 1.

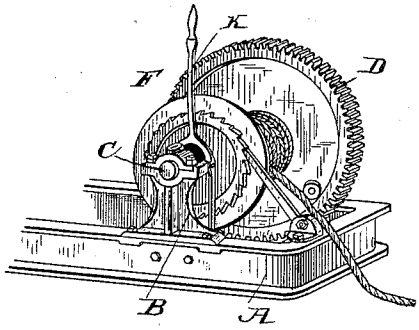


Fig. 3.

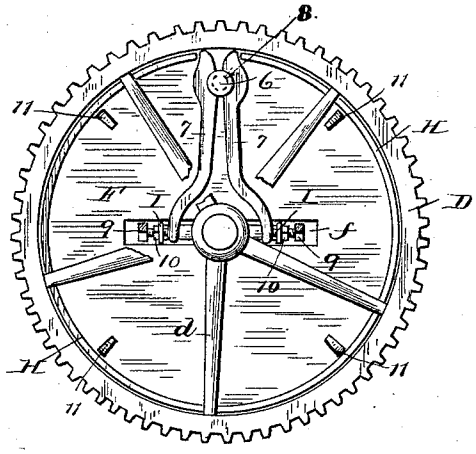


Fig. 2.

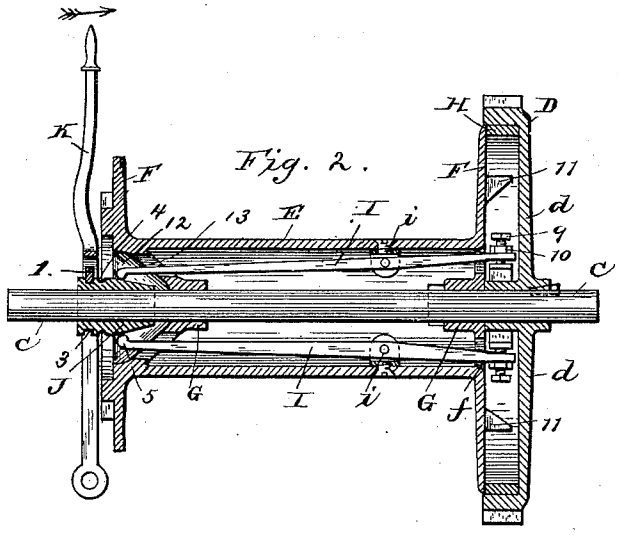
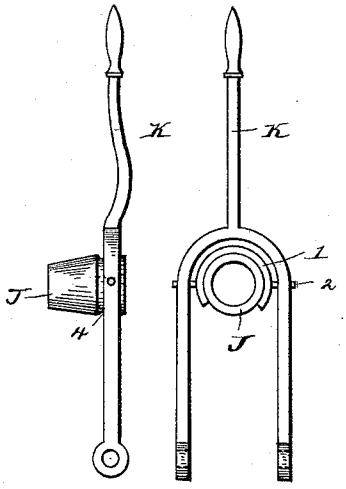


Fig. 4.



Witnesses

Harry L. Amer.

N. L. Collamer.

Inventor

James Clark.

By his Attorneys,

C. A. Snow & Co.

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

UNITED STATES PATENT OFFICE.

JAMES CLARK, OF MEDINA, NEW YORK.

FRICTION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 432,600, dated July 22, 1890.

Application filed March 18, 1890. Serial No. 344,395. (No model.)

To all whom it may concern:

Be it known that I, JAMES CLARK, a citizen of the United States, residing at Medina, in the county of Orleans and State of New York, have invented a new and useful Friction-Clutch, of which the following is a specification.

This invention relates to friction-clutches.

The object of the present invention is to provide a clutch operated by a lever moving longitudinally on the shaft through the instrumentality of a cone swiveled to said lever, and of pivoted levers operated by the longitudinal movement of said cone.

A further object is to provide improved means for distending a metallic band within a surrounding sleeve by the movement of the shorter arms of the pivoted levers, as well as of adjusting the connection between said band and levers.

To this end the invention consists in a pair of arms mounted on a disk within the drive-wheel, which arms are adapted at their outer ends to distend the band when their inner ends are brought together by the pivoted levers above mentioned, as well as of adjunctive and specific details of construction assisting in the accomplishment of the above object, and certain auxiliaries which tend to enhance the value of the complete device, all as hereinafter more fully described, and illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a winding-drum adapted to be rotated by suitable mechanism, (not shown,) to the interior of which my improved friction-clutch may be applied. Fig. 2 is a central longitudinal section of this drum and the drive-wheel, showing more clearly the construction of my improved friction-clutch as adapted to be used in this connection, although it will be understood that the clutch may be used elsewhere and for other purposes without departing from the spirit of my invention. Fig. 3 is an end view of the drive-wheel and disk. Fig. 4 illustrates the handle and cone in side elevation and end elevation.

Referring to the accompanying drawings, the letter A designates a base from which rise suitable standards B, and in the upper ends of these standards is journaled a driving-shaft C, upon which is keyed a drive-wheel D, adapted to be driven by a suitable source of power. (Not shown.)

The letter E designates a drum surrounding the shaft C and having disks F at its ends, which are journaled, as at G, upon the shaft C. One of the disks F stands in close contact with the inner side of the drive-wheel D, the rim of the latter extending inwardly from its spokes *d*, so that a space will be left between them and the disk F. A flexible band H is carried by the disk and is adapted to be distended or spread through levers I, pivoted at *i* within the drum E, and adapted to be separated at their free ends by means of a cone J, which is moved longitudinally on the shaft by an operating-handle K, all as is common and well known in devices of this general character.

Coming now to the present invention, 1 designates a collar pivoted on trunnions 2 in the bifurcated lower end of the handle K, and this collar engages an annular groove 3 near the outer end of the cone J. Inside this groove the cone is provided with another annular groove 4, adapted to receive rounded heads 5 upon the ends of the longer arms of the levers I, for a purpose to appear hereinafter.

The disk F is provided with radial slots *f* opposite its journal G, through which slots the shorter arms of the levers I extend, their ends therefore standing within the annular space around the shaft and between the disk and the spokes of the drive-wheel. The disk F is provided near its periphery with a headed pin 6, projecting into said annular space and standing against the opposite sides of said pin, and against the outer face of the disk are two arms 7, having semicircular notches or bearings 8, which engage the pin and around which these arms turn, the latter being approximately of the shape and relative proportion shown, and the notches 8 so placed that the inner portions of said arms will preferably be about five times as long as the outer portions. The shorter arms of the levers I (which are preferably about one-half the length of the longer arms) stand at their extremes outside the inner ends of the arms 7, and set-screws 9, having lock-nuts 10, are passed through said levers I and bear against the outside of the tips of the arms 7, as shown

in Fig. 3, the whole standing within said annular space.

A band H, which I preferably construct of cast-iron turned or planed so as to be perfectly true and having a slight contracting tendency by reason of its size, is placed within said annular space and rests at suitable points upon lugs or pins 11, carried by the disk F. This band is open for a slight distance at one side to allow it to expand and contract, and between the open ends thereof the outer extremities of the arms 7 are located, as shown in Fig. 3.

The operation of this improved friction-clutch, as used in connection with the above-described winding-drum, is as follows: The parts being in the position shown in Fig. 3, the exterior of the band H is just out of contact with the interior of the rim of the drive-wheel, and the latter rotates without turning the disk or the sleeve E. In this case it will be understood that the rounded heads 5 of the levers I rest directly upon the revolving shaft C. If now the handle K be moved in the direction of the arrow, the cone J will pass between said rounded heads, whereby they will be separated and the other ends of the levers I will approach each other, and this movement will be communicated through the set-screws 9 to the inner ends of the arms 7. This motion of the latter will cause a slight outward motion or separation of the outer ends of said arms, against which the extremities of the band H abut, and said band will therefore be slightly distended or spread, and will be brought into frictional contact with the inner face of the rim of the drive-wheel D. The power with which this frictional contact is made has been increased in the present instance by the leverage of the arms 7 and of the levers I, as well as by the gentle incline of the cone J and the leverage of the handle K. The disk F, being thus frictionally connected with the drive-wheel D, commences to rotate, and the drum E, and whatever other devices may be connected thereto, are also rotated; or if it may be desired to use a turning of the drum in the contrary direction and under friction, as would sometimes be necessary in the use of a winding-drum as here illustrated, the amount of friction and the force of contact between the band H and the rim of the drive-wheel D can be very nicely adjusted by moving the free end of the handle in the proper direction to cause the rounded heads 5 to be separated or to permit them to approach each other, a considerable movement of the free end of the handle causing an infinitesimally small variation in said force of contact between the parts. If it is desired to permanently couple the disk to the drive-wheel, so that pressure upon the handle by the operator can be withdrawn, said handle is forced inwardly to the extreme of its movement, whereby the annular groove 4 in the cone J will be passed between the rounded heads 5 on the levers I, the latter yielding or springing ever so slightly in their length to permit this movement. The device can then be left by the operator, and the drum and disk will continue to revolve in unison with the drive-wheel, and in this case the friction of the heads 5 within the groove 4 of the drum will be sufficient to turn the latter within the collar 1, so as to cause the cone to rotate with the other parts of the device and with the shaft C, if the drive-wheel be keyed thereon, as it is in the present instance. In order to render this winding-drum more compact, and in order that I may employ the devices above described without diminishing the length of the drum, I make the outer end 12 thereof funnel-shaped, as shown in Fig. 2, the bearing G being at the apex of the funnel and the disk F surrounding its larger end. The funnel is provided with two slots 13, through which the levers I project, whereby their outer ends may extend to such a position that they may be engaged by the cone J for its full length, this cone moving within the funnel in the operation of the device, all as will be clearly understood by a skilled mechanic.

What I claim is—

1. In a friction-clutch, the combination, with the drive-wheel, a disk journaled adjacent thereto, and a band carried by the disk inside the rim of the wheel and open at one side, of arms pivotally connected between their ends to said disk with their outer extremities standing in said opening between the ends of the band, a cone on the shaft of said wheel and disk, a handle for moving said cone, and levers pivotally connected with a drum, their outer ends bearing upon said cone and their inner ends upon the inner ends of said arms, as and for the purpose set forth.

2. In a friction-clutch, the combination, with the drive-wheel, the disk mounted on the shaft thereof, and clutch devices, substantially as described, between said wheel and disk, of a drum connected to said disk, levers pivoted within said drum, adjusting-screws through the inner ends of said levers bearing upon said clutch devices, a cone sliding upon said shaft between the outer ends of said levers, a collar engaging an annular groove in said cone, and an operating-handle connected to said collar, as and for the purpose set forth.

3. The combination, with the shaft and the levers having rounded outer ends, of the cone having an annular groove near its larger end adapted to receive said rounded ends, and also having a second groove, a collar seated in the latter groove, and a handle connected to said collar, the whole adapted for the use hereinbefore set forth.

4. In a winding-drum, the combination, with the main shaft C, and a drive-wheel D, keyed thereon, of two disks F, connected by a drum E, and having bearings G mounted upon said shaft, one of said bearings being

provided with a funnel-shaped outer end 12, having slots 13, clutch devices, substantially as described, between one disk and the drive-wheel, operating means also, substantially as described, located within said drum, and a handle for moving the latter, as and for the purpose hereinbefore mentioned.

5. In a clutch, the combination of the friction-band H, the arms 7, for distending the same, the levers I, for operating the arms, said levers having rounded outer ends 5 and having an adjustable connection with the arms 7, and the cone J, having a locking-groove 4 for the ends 5 of the levers and provided with an operating-lever for actuating the levers I, as set forth.

6. The combination, with the main shaft C, and a drive-wheel D, keyed thereon, of two disks F, connected by a drum E, and having bearings G mounted upon said shaft, one of said bearings being provided with a funnel-shaped outer end 12, having diametrically-opposite radial slots 13, clutch devices, substantially as described, between one disk and the drive-wheel, clutch-operating levers I, centrally pivoted within said drum thereon, opposite ends respectively engaging said clutch devices and extending through said slots, a cone J, mounted loosely on the main shaft within said funnel, and a lever K, for moving it longitudinally between the ends of the levers, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JAMES CLARK.

Witnesses:
E. G. SIGGERS,
R. J. MARSHALL.