

(No Model.)

W. H. MASTERMAN.
FRICTIONAL MOTION TRANSMITTER.

No. 502,570.

Patented Aug. 1, 1893.

Fig. 1.

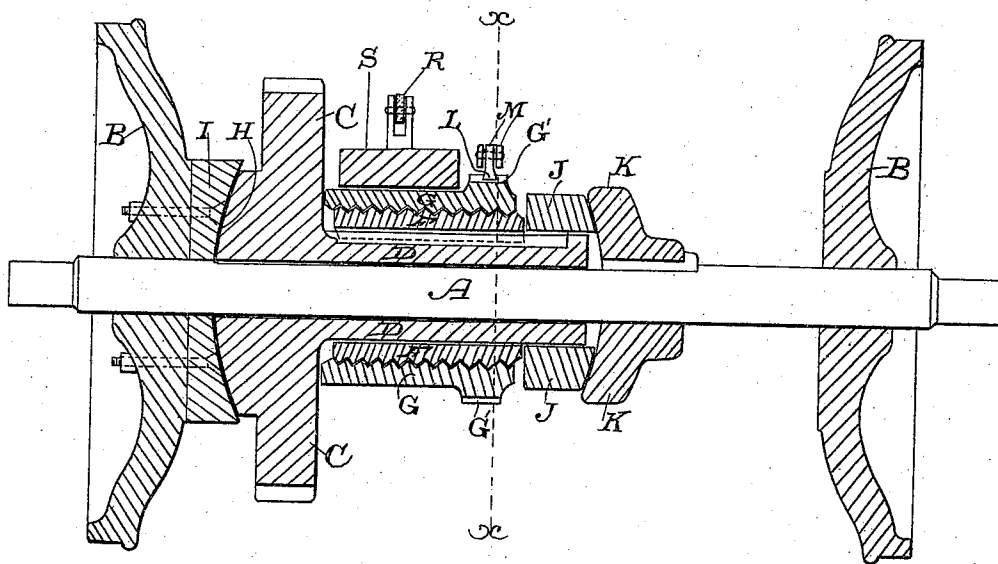
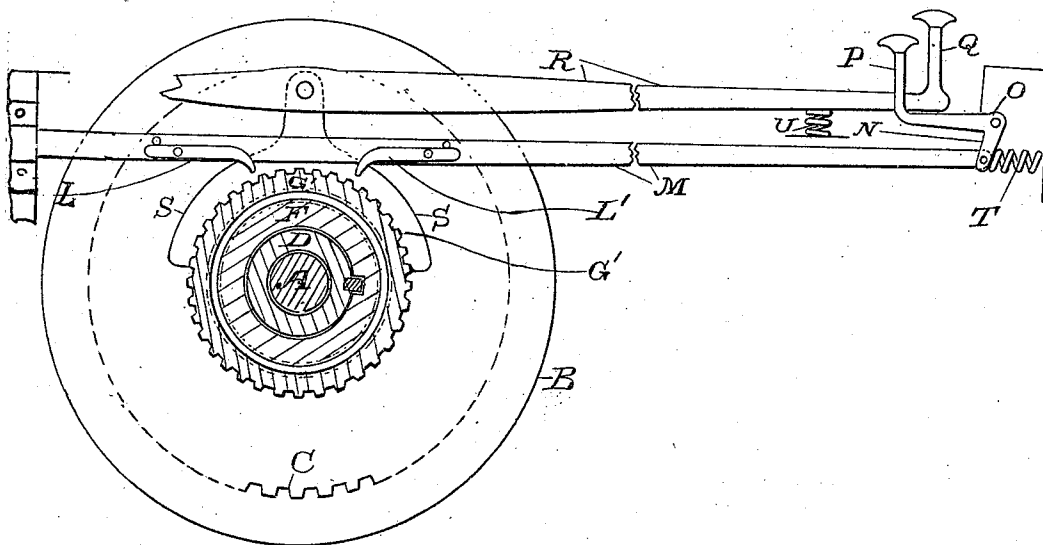


Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM H. MASTERMAN, OF OAKLAND, CALIFORNIA, ASSIGNOR OF TWO-THIRDS TO W. M. RANK AND F. H. MEYERS, OF SAME PLACE.

FRICTIONAL MOTION-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 502,570, dated August 1, 1893.

Application filed December 8, 1892. Serial No. 454,497. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. MASTERMAN, a citizen of the United States, residing in Oakland, Alameda county, State of California, have invented an Improvement in Frictional Motion-Transmitters; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device for communicating motion gradually from the driver to the driven part.

It consists in certain details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a vertical section taken longitudinally through the car axle and attachments. Fig. 2 is a transverse section on the dotted line of $x-x$ of Fig. 1.

The object of my invention is to provide a mechanism whereby motion may be gradually communicated from a motor to the part to be driven, whereby the latter may be started without bringing too great a strain or injury on the driving parts.

In the present case I have shown my invention applied to an electric motor, but it may be used equally well to transmit power in any machinery.

A is the axle of a car having the wheels B B of any usual or suitable construction. Power from the motor is usually communicated to the car axle by means of a pinion upon the motor shaft which engages the spur gear C upon the car axle, or by an equivalent device. In my invention I have shown this gear having a sleeve or extension D turning loosely upon the car axle. A sleeve F is fitted to slide lengthwise upon a feather on the sleeve D, while rotating with it, and the outside of the sleeve F is screw-threaded. Exterior to this is another sleeve G, the interior of which is correspondingly screw-threaded to fit the threads on the sleeve F. The spur gear C, or a hub which projects a little from it, is formed with a disk or frictional surface H which fits a corresponding frictional surface upon the disk I. This disk is fixed to the car axle, or, as shown in the present case, is bolted directly to the interior of the car wheel B. The frictional faces between the two may be of

any suitable shape. In the present case I have shown them as curved. Upon the opposite end of the sleeve, and beyond the two screw sleeves F and G, is a disk J, the outer face of which is made to form a frictional contact with the corresponding face of the disk K which is fixed to the car axle at a suitable point. The disk J slides upon a feather so as to have a longitudinal movement on the sleeve, while rotating with it. The outer sleeve G has a toothed periphery at G' which is adapted to be engaged by pawls L L' fulcrumed to a bar M which is movable horizontally with relation to the toothed disk G', one of said pawls engaging the disk G' on the forward movement of the bar and the other pawl engaging said disk on the return movement of said bar. In the present case I have shown this bar M connected with one arm of a bell crank lever N, which is fulcrumed as shown at O to some part of the car. The other arm of this lever has extending up from it, a foot-piece P, within convenient reach of the motor-man.

When moved in one direction the pawl L engages the teeth of the disk G' and thereby turns the sleeve G a short distance upon the sleeve F, causing it to advance correspondingly in the screw threads of said sleeve F, and easing the frictional contact between the disks H and J and their opposing members I and K, whereby the motor may drive the gear, its sleeve and supported parts freely, without communicating motion to the car axle. When the foot is removed from the foot piece P, the spring T returns the bar M, and the pawl L' engages the toothed disk G' whereby the sleeves are moved along each other slightly or until their frictional ends nearly or quite come into contact with the opposing surfaces of the gear C and disk J.

When the apparatus is to be started the motor-man places his foot upon the pedal piece Q on the lever R, which action depresses the lever R and causes the friction clamp S which it carries to press upon the periphery of the sleeve G. This action temporarily holds the sleeve G against rotation, while the rotation of the gear C and its sleeve, by power derived from the motor, causes the sleeve F to move longitudinally in one direction and the sleeve G to move longitudinally

in the opposite direction by reason of the screw threads between them. This forces one of the frictional surfaces H into contact with its opposing surface, and the corresponding frictional surfaces J and K are also forced into contact with sufficient pressure to transmit the power of the motor to the car axle, and cause the latter to rotate. It will be manifest that this may be accomplished as gradually as may be desired, and thus the power to start the car will not be so abruptly applied as to injure the motor, as is frequently the case under ordinary conditions where the whole weight of the car must be started at once.

T is a spring which returns the foot-lever P, and connected parts to their normal positions when released, and U is a similar spring acting upon the lever R and foot-piece Q for the same purpose.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a shaft and parts to be driven, of frictional devices fixed thereto, a gear to which power is to be applied having a sleeve rotating loosely upon the shaft between said frictional devices, opposing frictional devices rotating with the sleeve and movable inwardly and outwardly with relation to the frictional devices fixed upon the shaft, and screw-threaded sleeves turning upon each other and acting to force the movable frictional devices into and out of contact with the opposing fixed ones, substantially as herein described.

2. A shaft to be driven having friction disks fixed to rotate with the shaft, a gear having a sleeve which turns loosely upon the shaft, through which power is applied from a motor, movable disks having faces corresponding with those of the disks fixed to the shaft and rotating with the gear and sleeve, a second

sleeve surrounding the gear sleeve movable longitudinally thereon by means of a feather, and having its outer circumference screw-threaded, a second sleeve having its inner circumference screw-threaded to fit the exterior of the first named sleeve, a clamping shoe, and a lever by which it is forced into contact with the exterior sleeve so that the interior one rotates with the gear-wheel, and the exterior one remains stationary, whereby the two are moved longitudinally in opposite directions to force the frictional surfaces into contact, substantially as herein described.

3. A shaft and connected parts to be driven having a gear provided with a sleeve to rotate loosely thereon, disks fixed to revolve with the shaft exterior to the gear and its sleeve at opposite ends, correspondingly faced disks rotating with the driving gear and movable longitudinally so as to be forced into contact with the stationary disks or withdrawn therefrom, a sleeve movable upon a feather longitudinally upon the gear sleeve having its exterior screw-threaded, a correspondingly screw-threaded sleeve fitting outside of the first named one, a frictional clamp or brake by which the exterior sleeve is held stationary while the interior one rotates within it whereby the two are moved in opposite directions so as to force the frictional surfaces into contact, and a longitudinally moving bar M, with foot lever whereby it is actuated and a pawl L adapted to engage the toothed periphery of the outer sleeve and move it backward so as to release and disengage the frictional surfaces, substantially as herein described.

In witness whereof I have hereunto set my hand.

WILLIAM H. MASTERMAN.

Witnesses:

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