No. 796,416. PATENTED AUG. 8, 1905.

F. L. EAGER.

MECHANICAL MOVEMENT.

APPLICATION FILED DEC. 17, 1904.

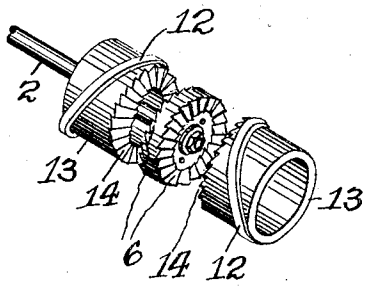


Fig. 1.

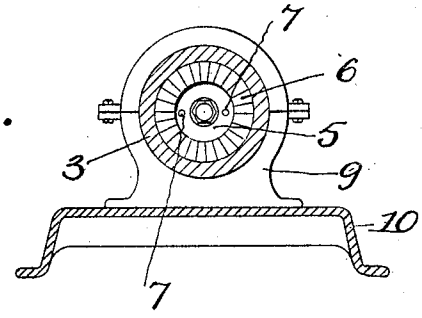


Fig. 2.

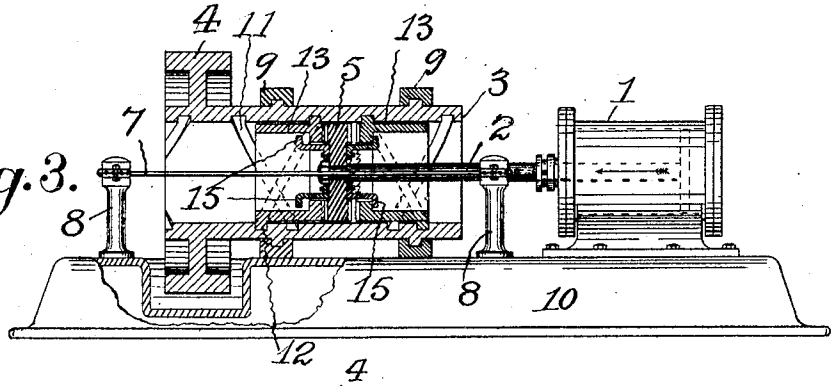


Fig. 3.

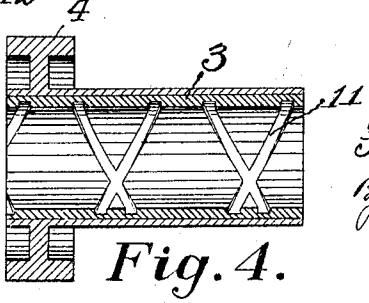


Fig. 4.

Witness
L. C. Berkowitz
B. E. Cohen

Inventor
Frank L. Eager
By Jenkins & Baker
Attorneys

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK L. EAGER, OF WATERBURY, CONNECTICUT.

MECHANICAL MOVEMENT.

No. 796,416. Specification of Letters Patent. Patented Aug. 8, 1905.

Application filed December 17, 1904. Serial No. 237,300.

To all whom it may concern:

Be it known that I, FRANK L. EAGER, a citizen of the United States, and a resident of Waterbury, in the county of New Haven and State of Connecticut, have invented a new and Improved Mechanical Movement, of which the following is a specification.

My invention relates to the class of devices for converting a reciprocating into a rotary movement and finds ready application in connection with the piston of an engine; and the object of my invention is to provide a device of this class of extreme simplicity in construction and in operation.

One form of device in the use of which the objects sought may be attained is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the clutch-plate and clutch-sleeves. Fig. 2 is a view in vertical crosswise section through the device on a plane passing between the clutch-plate and clutch-sleeves and looking toward the cylinder, the fingers being removed. Fig. 3 is a view in elevation of the device, the pulley and adjacent parts being cut in vertical longitudinal section. Fig. 4 is a detail view, in longitudinal section, through the pulley and its hub.

In the accompanying drawings, the numeral 1 denotes a cylinder in which a piston may be located and operated in any well-known manner and from which, through the end of the cylinder, a piston-rod 2 extends. This piston-rod projects into a hollow neck 3 of a driving wheel or pulley 4. A clutch-plate 5 is secured to the piston-rod within said neck, and said plate bears upon opposite sides ratchet-teeth 6, each set of these teeth being circularly disposed near the edge of the plate. Guide-rods 7 are mounted in standards 8 and extend through the neck and pulley, these rods being preferably located on opposite sides of the piston-rod and extending through the clutch-plate 5, that has a free reciprocating movement upon said rods, but is prevented from turning movement thereby.

The pulley 4 is suitably mounted in bearings, in the form herein shown the neck 3 being mounted in the bearings 9 from the bed 10 of the machine. The inner surface of the neck is provided with spirally-arranged grooves extending in directions transversely each of the other, these grooves 11 being formed to receive a thread or section of a thread 12 from clutch-sleeves 13. There are two of these clutch-sleeves, the thread on one meshing with the groove in the neck extending in one direction and the thread on the opposite sleeve meshing with the groove in the neck extending in the transverse direction. Each of these sleeves bear at one end teeth 14. The ratchet-teeth 6 in each set on the clutch-plate 5 incline in opposite directions, and the teeth on the end of each of the clutch-sleeves 13 are formed to mesh and be engaged by the teeth on that face of the clutch-plate appurtenant to the sleeve.

Fingers 15 extend from the clutch-plate 5 into each of the sleeves 13, the ends of each of these fingers being bent to engage a shoulder on the inner surface of each of the sleeves. The bent end of each of these fingers is so located with respect to the shoulder that a movement of the clutch-plate sufficient to disengage the teeth thereon from the teeth of the sleeve is permitted before the finger engages the shoulder on that sleeve which has been disengaged from the clutch-plate. In the further movement of the clutch-plate the sleeve will then be drawn along by the engagement of this finger with the shoulder.

It will be obvious that the details of construction herein shown and described need not be minutely followed to embody the invention, but that the construction may be departed from to a considerable extent without avoiding the invention.

In some forms of the device it may be desirable to construct the spirally-arranged grooves in the metal of which the neck is formed, and in other forms of construction, and as shown herein, these grooves may be formed in a lining secured within the neck. In the latter form of construction it may be obvious that different linings may be placed within the sleeve to obtain a greater or less degree of rotary movement of the pulley in one stroke of the piston-rod or to reverse the direction of movement of said pulley.

In the operation of the device, the piston being reciprocated by force under pressure in the usual manner, it is projected forward, and the teeth on the forward face of the clutch-plate coming in engagement with the forward sleeve lock the clutch-plate and sleeve together, and the thread on the sleeve engaging the inner surface of the neck causes the pulley to be rotated in a certain direction. When the piston reaches the end of its forward stroke and starts backward, the teeth on the clutch-plate are released from the teeth on the forward sleeve and engage with the teeth on the

rearward sleeve, the finger from the clutch-plate, however, engaging the forward sleeve and drawing it backward with the clutch-plate. In this backward movement the thread on the rearward clutch-sleeve engaging with a groove extending in the transverse direction to the groove engaged by the thread on the forward sleeve, the pulley continues to rotate in the same direction as that of the teeth moved by the forward sleeve, the latter, however, turning with the pulley.

An important feature of the invention resides in the construction whereby a spirally-arranged groove and a projection engaging said groove are always located within the rotating member, and while there is illustrated and described herein a groove located on the inner surface of the rotating member with a projection from a sleeve engaging said groove, it will be obvious that this construction may be varied to include the features just above referred to and without departing from the invention and that the thread may be of any desired length to properly perform the function required thereof.

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

1. In combination with a reciprocating member and means for driving it, a pulley having a hub, sleeves located within said hub and surrounding the driving member, and connections between the reciprocating member and the pulley including a spirally-arranged groove upon one part and a projection upon another part engaging said groove, said groove and projection being permanently located within the hub of the pulley.

2. In combination with a reciprocating member and means for driving it, a pulley having a hub, sleeves located within said hub, said pulley and sleeve having interengaging projections and spirally-arranged grooves, a plate secured to the reciprocating member, and means for alternately engaging and disengaging said plate with said sleeves.

3. In combination with a reciprocating member, and means for driving it, a pulley having a hub, a sleeve located within the hub, said pulley and sleeve having an interengaging projection and spirally-arranged groove, a plate secured to the reciprocating member, and means for engaging said plate with said sleeve.

4. In combination with a reciprocating member and means for driving it, a rotating member, clutch-sleeves located within the rotating member, said pulley and sleeve having an interengaging projection and spirally-arranged groove upon said parts, a plate secured to the reciprocating member, and means for engaging and disengaging said plate and sleeve.

5. In combination with a reciprocating member with means for driving it, a rotating member having an internal spirally-arranged groove, a sleeve located within the rotating member and having a projection engaging said groove, a plate secured to the reciprocating member, and means for engaging and disengaging said plate and said sleeve.

6. In combination with a reciprocating member with means for driving it, a pulley with its hub having internally spirally-extending grooves arranged transversely each of the other, sleeves located within the hub, each having a projection engaging one of said grooves and ratchet-teeth on the end thereof, and a plate secured to the reciprocating member and having teeth to engage the teeth alternately on said sleeves.

7. In combination with a reciprocating member with means for driving it, a rotating member having internally spirally-extending grooves arranged transversely each of the other, sleeves located within the rotating member, each having a projection engaging one of said grooves and ratchet-teeth on the ends thereof, a plate secured to the reciprocating member and having teeth to engage the teeth on said sleeves, and guides for said plate.

8. In combination with a reciprocating member with means for driving it, a rotating member having internal spirally-extending grooves arranged transversely each of the other, sleeves located within the rotating member each having a projection engaging one of said grooves and ratchet-teeth on the ends thereof, a plate secured to the reciprocating member and having teeth to engage the teeth on said sleeves, and fingers extending from said plate to engage said sleeves.

FRANK L. EAGER.

Witnesses:
ARTHUR B. JENKINS,
LENA E. BERKOVITCH.