R. Z. FARMER.

POWER TRANSMITTING DEVICE.

APPLICATION FILED JUNE 7, 1920.

1,416,182.

Patented May 16, 1922.

2 SHEETS—SHEET 1.

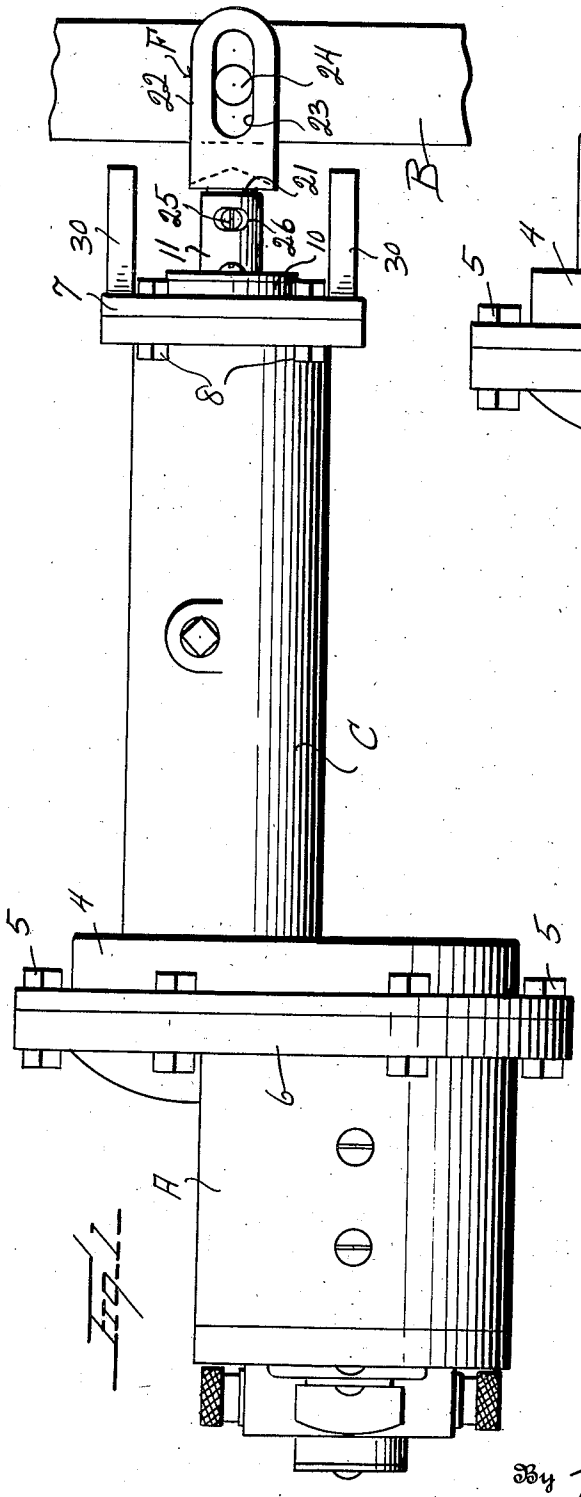


Fig. 1.

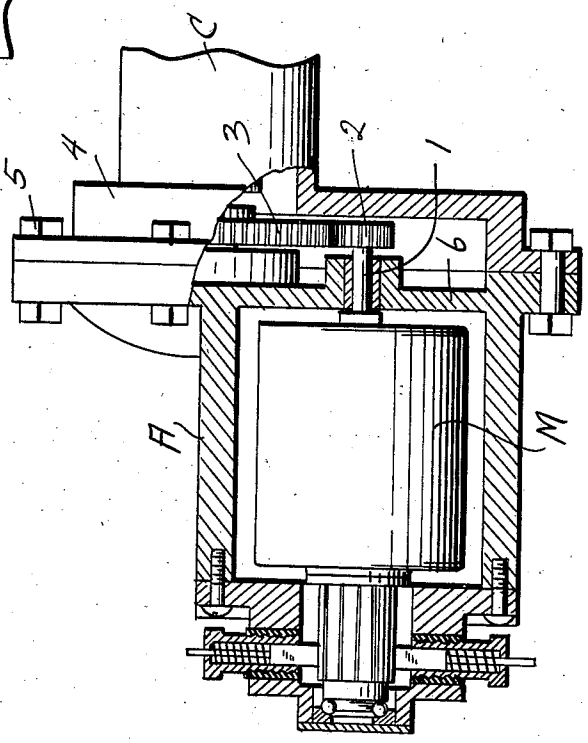


Fig. 2.

Inventor

R. Z. Farmer

By Watson E. Coleman

Attorney

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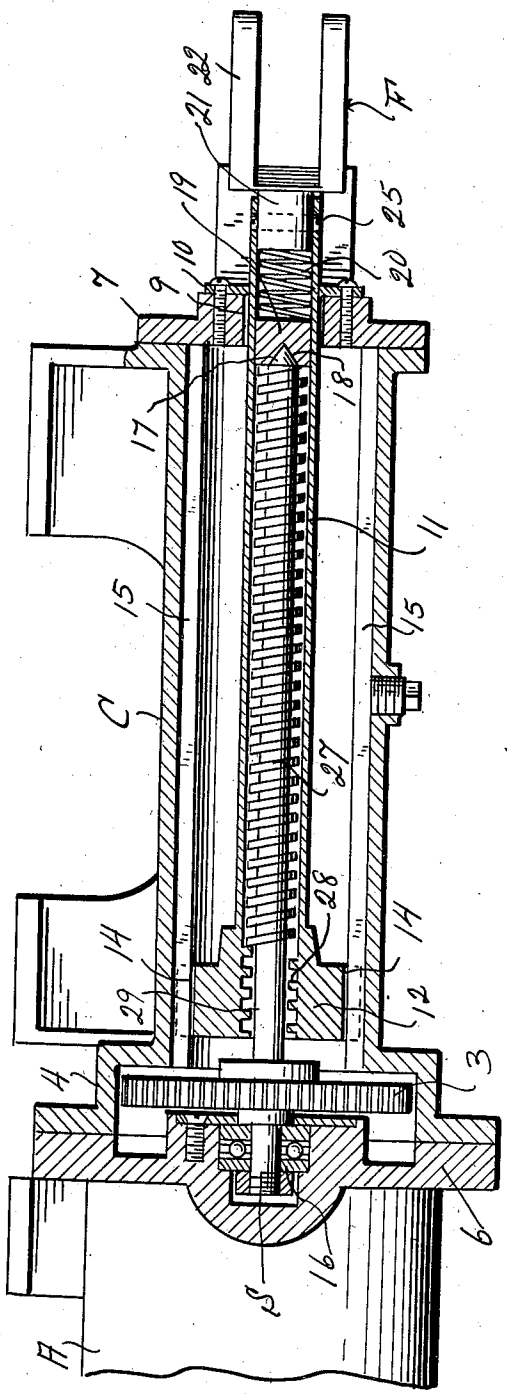


Fig. 3.

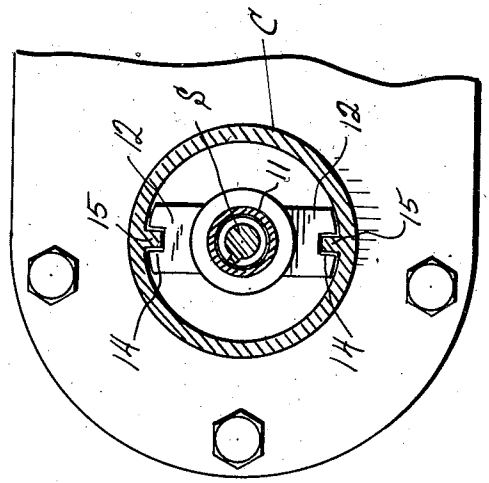


Fig. 5.

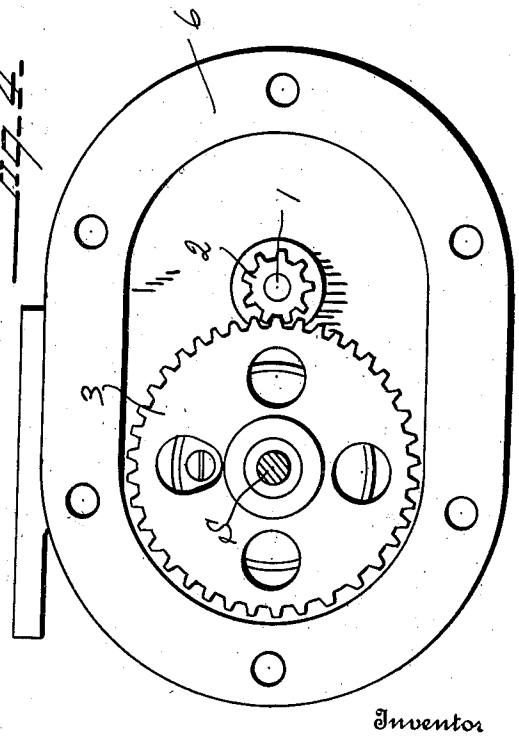


Fig. 4.

Inventor

R. Z. Farmer

By Watson E. Coleman

Attorney

UNITED STATES PATENT OFFICE.

ROBERT Z. FARMER, OF ROSEBURG, OREGON, ASSIGNOR TO AUTOMATIC ELECTRIC BRAKE COMPANY, A CORPORATION OF OREGON.

POWER-TRANSMITTING DEVICE.

1,416,182. Specification of Letters Patent. Patented May 16, 1922.

Application filed June 7, 1920. Serial No. 387,100.

To all whom it may concern:

Be it known that I, ROBERT Z. FARMER, a citizen of the United States, residing at Roseburg, in the county of Douglas and State of Oregon, have invented certain new and useful Improvements in Power-Transmitting Devices, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to certain improvements in power transmitting devices, and it is an object of the invention to provide a device of this general character having novel and improved means whereby endwise movement may be imparted to a member from a rotary driving element.

It is also an object of the invention to provide a novel and improved device of this general character including a driven shaft in threaded engagement with a non-rotatable body and which body is supported for endwise movement upon rotation of the shaft.

An additional object of the invention is to provide a novel and improved device of this general character particularly designed and adapted for use in connection with the fulcrum bar of a vehicle or railway brake, the operating lever of a locomotive reverse, or other member adapted to be moved in opposite directions at will.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved power transmitting device whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of my invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:

Figure 1 is a view in plan of a device constructed in accordance with an embodiment of my invention and shown operatively engaged with the fulcrum bar of a brake rigging.

Figure 2 is a fragmentary view partly in section and partly in plan of the rear portion of the device as shown in Figure 1.

Figure 3 is a fragmentary view partly in section and partly in side elevation of the forward portion of the device as illustrated in Figure 1, the fulcrum bar being omitted.

Figure 4 is a view in elevation with the driven shaft in section illustrating the driving connection between the armature and the driven shaft, and

Figure 5 is a transverse sectional view taken through the forward portion of the device as illustrated in Figure 3.

As disclosed in the accompanying drawings, my improved device is shown in operative engagement with the fulcrum bar B of the draft rigging now generally employed in connection with trolley cars or the like, but it is to be understood that the present invention is not limited to this particular use as the same can be employed to equal advantage in connection with the brake mechanism of an automobile and under which conditions the device is reversed vertically from what is shown in the accompanying drawings. It is also to be understood that my improved device may be employed in connection with the operating lever of a locomotive reverse or in connection with any other movable member adapted to be operated or moved in opposite directions at will.

As disclosed in the accompanying drawings, A denotes a hollow case of suitable dimensions and configuration and in which is mounted a motor M of an electrical type and which motor is adapted to be rotated in reverse directions as required through the instrumentality of a reversing switch interposed in the operating circuit (not shown) for the motor.

The armature or driving shaft 1 of the motor M extends exteriorly of the base A through an end or head thereof and secured in said extended portion in a pinion 2. The pinion 2 is in mesh with a gear 3 fixed to the shaft S to be hereinafter more particularly referred to.

C denotes an elongated cylindrical casing having one end portion enlarged, as at 4, and which is bolted, as at 5, or otherwise secured to the head 6 of the base A through which the armature or driving shaft 2 extends and whereby the pinion 2 and gear 3 are enclosed or housed. The opposite or outer end portion of the casing C is closed by a removable head 7 maintained in applied position through the instrumentality of the bolts 8 or as otherwise preferred.

The head 7 is provided with a central opening 9 positioned at the axial center of the casing C when applied or in longitudinal alinement with the shaft S.

Secured to the outer face of the head 7 is an annular member 10 having its internal peripheral portion partially overlying the opening 9 and which member 10 constitutes a bearing for the tubular piston 11. The inner end portion of the piston 11 is provided with outwardly directed and radially alined wings or lugs 12 provided in their outer ends with the grooves 14, said grooves 14 being disposed in a direction longitudinally of the piston 11.

Extending within the grooves 14 are the inwardly disposed ribs or flanges 15 carried by the wall of the casing C and extending from the large portion 4 of said casing to the opposite end thereof. The lugs or wings 12 and the ribs or flanges 15 coact in a manner whereby the piston 11 is held against rotary movement but is permitted to have endwise movement.

One end portion of the shaft S is rotatably supported by a thrust bearing 16 arranged within the head 6 of the base A while the opposite end portion of said shaft S extends inwardly of the piston 11. The inserted end portion of the shaft S is tapered or conical, as at 17, and engages within a conical recess 18 provided in the inner face of the bearing block 19. The block 19 is snugly engaged within the outer end portion of the piston 11 but is capable of movement in a direction lengthwise of said piston 11.

The block 19 is constantly urged inwardly through the medium of the expansible member 20 herein disclosed as a coiled spring interposed between the block 19 and the shank 21 engaged within the outer end of the piston 11. The outer end of the shank 21 is provided with a fork F, the arms 22 of which straddling the fulcrum bar B and each of said arms 22 is provided with a longitudinally disposed slot 23 through which extends a pin or lug 24 carried by the bar B so that upon endwise movement of the piston 11, a desired swinging movement will be imparted to the bar B.

The shank 21 is keyed to the piston 11 through the instrumentality of the screw or shank 25 threaded through the shank 21 and having its end portions engaged within the circumferentially disposed slots 26 provided in the wall of the piston 11. By this means, the shank 21 and the fork F are capable of slight rotary movement relative to the piston 11 to compensate for any irregularity in the direction of travel of the fulcrum bar B.

The shaft S from its inserted end portion and throughout the major portion of its length is provided with the square thread 27 with which is adapted to engage the internal square thread 28 carried by the inner end portion of the piston 11. The expansible member or spring 20 in addition to constantly urging the bearing block 19 inwardly, also operates to constantly urge the piston 11 forwardly, so that when the piston 11 is in release or neutral position, the threads 27 and 28 are maintained in such position that immediately upon rotation of the shaft S in the requisite direction, the threads 27 and 28 will engage in such manner to cause the piston 11 to move outwardly.

The threads 27 terminate at a predetermined point in advance of the gear wheel 3 whereby the periphery of said portion of the shaft S is smooth and unobstructed, said portion 29 being of a length in excess of the length of the internal threads 28. By this means, when the piston 11 is in release or neutral position, it will not jam as the threads 27 and 28 are disconnected.

The head 7 is provided at diametrically opposed points with the outstanding ears or lugs 30 with which the fulcrum bar B or other element to which the fork F may be attached is adapted to contact to prevent the same from jamming and particularly when the fulcrum bar or the like is being adjusted or set with respect to the fork F.

From the foregoing description it is thought to be obvious that a power transmitting device constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice except as hereinafter claimed.

I claim:

1. A device of the class described comprising a tubular piston supported for endwise movement, a shaft extending within the piston, a bearing block within the outer end portion of the piston for coaction with the inserted end of the shaft, said block being movable lengthwise of the piston, and yieldable means for urging the block inwardly of the piston.

2. A device of the character described comprising an elongated casing, an endwise movable tubular piston extending within the casing, coacting means carried by the piston and the casing to hold the piston against rotary movement, a shaft extending within the piston through the inner end thereof, a bearing block slidably engaged within the outer end portion of the piston for coaction with the inserted end of the shaft, yieldable means for urging the bear-

ing block inwardly of the piston, said shaft and piston being provided with coacting threads, and means for rotating the shaft.

3. A device for the character described comprising an elongated casing, an endwise movable tubular piston extending within the casing, coacting means carried by the piston and the casing to hold the piston against rotary movement, a shaft extending within the piston through the inner end thereof, a bearing block slidably engaged within the outer end portion of the piston for coaction with the inserted end of the shaft, yieldable means for urging the bearing block inwardly of the piston, said shaft and piston being provided with coacting threads, and means for rotating the shaft, said shaft rotating independently of the piston when the piston is at the limit of its movement in one direction, said piston when in said last named position placing the yieldable means coacting with the bearing block under tension to urge the piston in a direction to cause the threads of the piston and the threads of the shaft to engage.

4. In combination with a movable member, a shaft, a tubular piston threaded on said shaft and in operative connection with the movable member, means for rotating the shaft for imposing push or pull upon the piston, and yieldable means within the tubular piston for limiting the movement of the piston in one direction.

5. In combination with a movable member, a shaft, a tubular piston threaded on the shaft and in operative connection with the movable member, means for rotating the shaft for imposing push or pull upon the piston, and expansible means within the piston for limiting the movement of the piston in one direction.

6. A device of the character described comprising a casing, a piston movable within the casing, a member exteriorly of the casing with which the piston is operatively connected, and an outstanding ear carried by the casing with which the member is adapted to contact.

7. A device of the character described comprising a casing, a piston movable within the casing, a member exteriorly of the casing with which the piston is operatively connected, and an outstanding ear carried by the casing with which the member is adapted to contact, the connection between the piston and the member being loose.

In testimony whereof I hereunto affix my signature.

ROBERT Z. FARMER.