April 15, 1924.

U. I. T. BLOMBERG

1,490,796

GEARING

Filed May 10, 1922

Fig. 1.

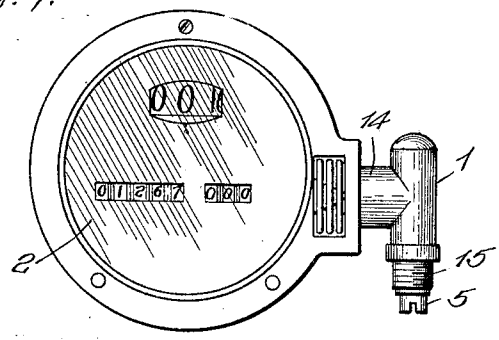

Fig. 2.

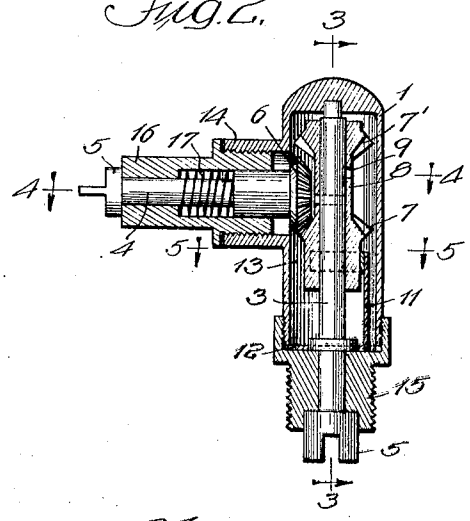

Fig. 3.

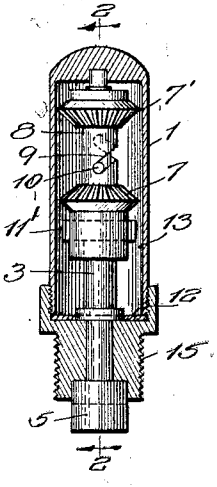

Fig. 4.

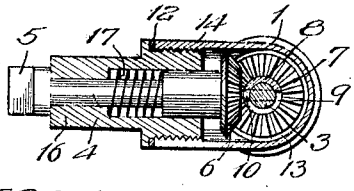

Fig. 5.

Witnesses:
W. P. Kilroy
Harry A. L. White

Inventor:
Ulrick I. T. Blomberg,
By Hill & Hill
Attys

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UNITED STATES PATENT OFFICE.

ULRIK I. T. BLOMBERG, OF CHICAGO, ILLINOIS.

GEARING.

Application filed May 10, 1922. Serial No. 559,783.

To all whom it may concern:

Be it known that I, ULRIK I. T. BLOMBERG, a subject of the King Sweden, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gearing, of which the following is a specification.

My invention relates to improvements in gearing, and more particularly to means whereby a drive shaft may be rotated in either direction to drive a second shaft always in the same direction.

Another object of my invention is to provide means for accomplishing the above purpose, which means will be automatically operative.

The invention has among its other objects the production of a device of the kind described which is simple, compact, durable, reliable, efficient and satisfactory for use wherever found applicable.

Many other objects and adavantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosures herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts,

Fig. 1 is a plan view of my device as applied to a speedometer;

Fig. 2 is a sectional view through my device;

Fig. 3 is a section taken substantially on the line 3—3 of Fig. 2;

Fig. 4 is a section taken substantially on the line 4—4 of Fig. 2;

Fig. 5 is a section taken substantially on the line 5—5 of Fig. 2.

It is sometimes desirable to continuously drive a shaft in one direction irrespective of the direction in which the driving shaft is rotated, as for instance in certain testing or recording mechanism in which it is desired to have a record of the total number of revolutions of the driven shaft.

In the drawings, wherein there is illustrated the preferred embodiment of my invention, 1 indicates my gearing as a whole, which as shown, is operatively connected to drive any suitable device as, for instance, a recording instrument 2, such as a speedometer or the like or it may be built in the instrument itself, but it is to be understood that the recording instrument does not form a part of my invention. In the gearing, 3 indicates the driving shaft and 4 the driven shaft, said shafts being preferably arranged laterally of one another. At the outer ends of the shafts 3 and 4 are arranged heads 5 for attachment to external means for driving said shafts and for receiving the drive therefrom respectively. Any manner of means may be provided for driving the shaft 3, as for instance a suitably driven flexible shaft or the like, not shown.

At the inner end of the shaft 4 is arranged a gear 6, preferably beveled, as shown, and upon the shaft 3 is arranged a pair of gears 7, 7′, spaced apart and connected by a sleeve 8 so that said gears 7, 7′, will move together. The sleeve 8 is slidable and partially rotatable on the shaft 3, so that the gear 7, 7′ will mesh alternately with the gear 6, as will be hereafter described, whenever said sleeve is moved on the shaft.

In order to automatically effect the sliding movement of the gear 7, 7′, upon the shaft 3 and to limit its rotational movement thereon, the sleeve has a helical groove or opening 9, formed therein into which extends a pin 10 projecting from the shaft 3, so that when the shaft 3 is rotated relatively of the sleeve 8, the pin 10 will slide in the groove or cam way 9 to move the sleeve and gears carried thereby axially of the shaft until the pin reaches one end of the groove and limits any further relative movement therebetween, the continued rotation of the shaft 3 driving the sleeve and gears.

It is obvious that as the shaft 3 is rotated in one direction, one of the gears of the pair, as for instance the gear 7, will be in mesh with the gear 6 to drive the shaft 4 in a given direction, and as soon as the drive of the shaft 3 is reversed, the pair of gears will be slid together relatively of the shaft 3 to engage the second gear 7′ with the gear 6 to continue to drive the shaft 4 in the same direction in which it was driven previously, or, in other words, it is true that irrespective of the direction in which the shaft 3 is rotated, the gears 7, 7′ will be automatically shifted so that the shaft 4 will continue to be driven always in the same direction.

In order to more efficiently accomplish the

shifting of the gears 7, 7', upon the shaft 3, I have provided a brake 11 in frictional contact with the sleeve 8 and held stationary by any desired means, as for instance by having an extension thereof 12 clamped between the parts of the gear casing so that whenever the drive of the shaft 3 is reversed, the brake 11, which bears on the sleeve 8 and will temporarily prevent said sleeve from rotating with the shaft, but permit its axial movement thereon, until the pin 10 reaches the end of the groove, whereupon the shaft drives the sleeve in the direction in which the shaft rotates.

In order to enclose the moving parts and to provide a lubricant-containing chamber in which the gears may operate, a hollow casing having laterally arranged openings 13 and 14 is provided, into which openings are extended the shafts 3 and 4, respectively. The shafts 3 and 4 are removably held in said casing by means of plugs or closures 15 and 16 detachably connected to the casing, and if desired said rotating parts may be provided with ball bearings. A spring 17 may be interposed between said gear 6 and casing to yieldably permit the sliding of said shaft 4 relative to the casing to move the gear 6 forwardly into mesh and also to permit it to move rearwardly or outwardly whenever the driving pressure becomes excessive, separating said gears from mesh and preventing injury thereto. From the foregoing it is obvious that there is provided an extremely simple and compact device wherein a driven shaft may be rotated continuously in one direction irrespective of the direction of rotation of the driving shaft. The device may be used with any type of drive regardless of "right" or "left." If a shaft is intended to be rotated in a given direction, then when connected up with my device, it will be driven in that direction irrespective of the direction of rotation of the driving shaft.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. In combination, a drive shaft, a driven shaft, a gear on one of said shafts, a pair of axially spaced rigidly interconnected gears on the other shaft and adapted to mesh alternately with said first-mentioned gear, a pin and helical groove connection between said pair of gears and their shaft to control the sliding of said pair of gears thereon, and frictional means constantly engageable with said pair of gears for shifting them on said shaft.

2. In a device of the kind described and in combination, a driven shaft having a gear, a driving shaft, a sleeve thereon carrying a pair of gears spaced apart adapted to mesh alternately with said first-mentioned gear, and means between said sleeve and drive shaft to control the sliding of said sleeve thereon and comprising a helical groove in one of said parts and a pin carried by the other of said parts and engageable in said groove, and frictional means constantly engageable with said sleeve for shifting said sleeve on said shaft.

3. In a device of the kind described and in combination, a driven shaft having a gear thereon, a driving shaft, a sleeve rotatable and slidable on said driving shaft, a pair of gears spaced on said sleeve and adapted to mesh alternately with said first-mentioned gear, means for resiliently holding said gears in mesh, means for limiting the sliding and rotation of said sleeve on the shaft, and brake means holding said sleeve frictionally against rotation, whereby said sleeve will slide on the shaft whenever the drive is reversed, to drive said first mentioned shaft always in one direction.

4. In a device of the kind described and in combination, a driven shaft having a gear thereon, a driving shaft laterally thereof, a sleeve slidable and partially rotatable on said driving shaft, a pair of gears spaced on said sleeve and adapted to mesh alternately with said first-mentioned gear at each reversal of rotation of the drive shaft, means for limiting the sliding and rotation of said sleeve on the shaft in both directions, comprising a groove formed in one of said parts, and a pin on the other of said parts and engageable in said groove, and a brake constantly frictionally engageable with said sleeve so that whenever the direction of drive rotation is reversed said pin will ride in said groove to slide said sleeve on the shaft and position said gears to properly mesh with said first-mentioned gear.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

ULRIK I. T. BLOMBERG.

Witnesses:
ROY W. HILL,
RUTH M. EPHRAIM.