Aug. 12, 1924. 1,504,237

J. F. HALVERSON

RATCHET DRIVE MECHANISM

Original Filed Oct. 18, 1921

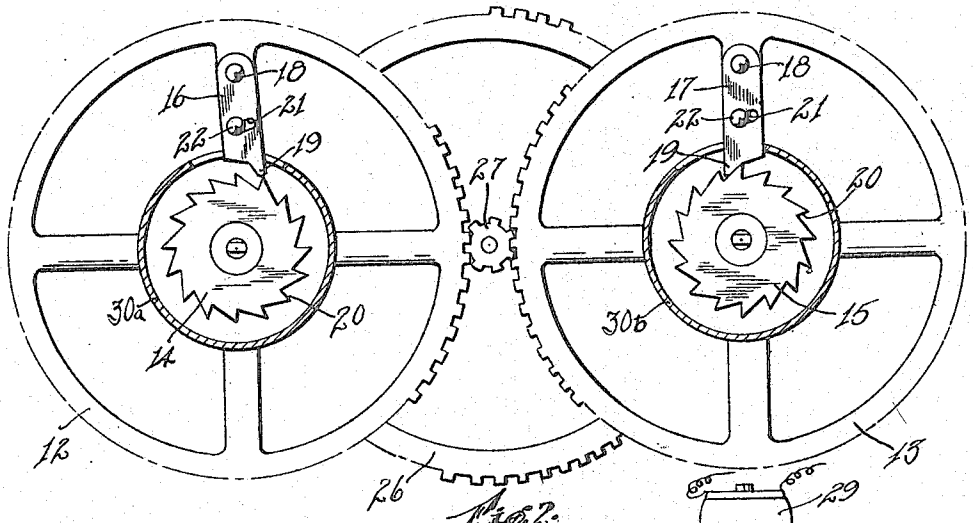

Fig. 2.

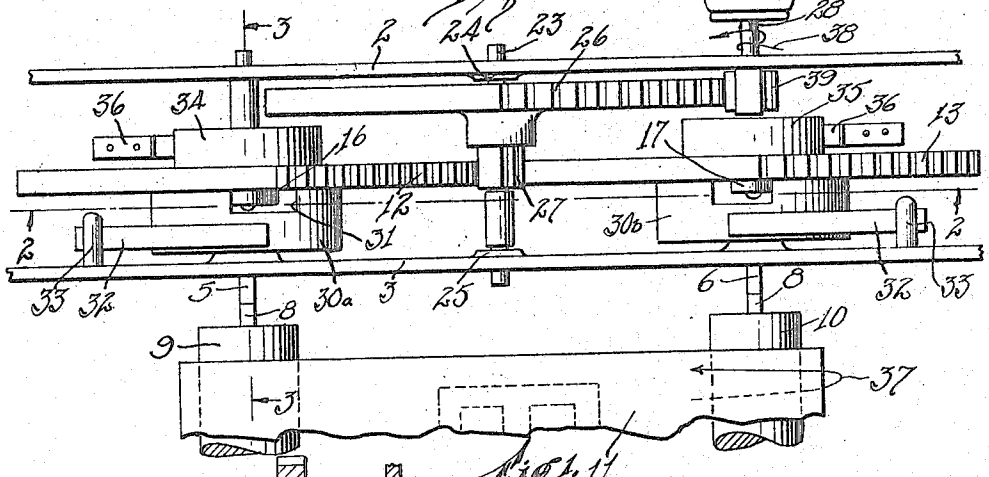

Fig. 1.

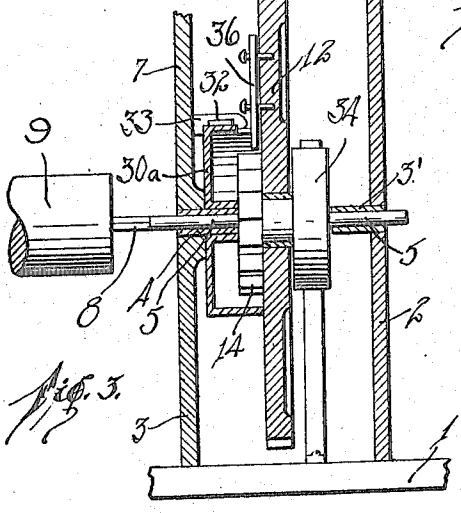

Fig. 3.

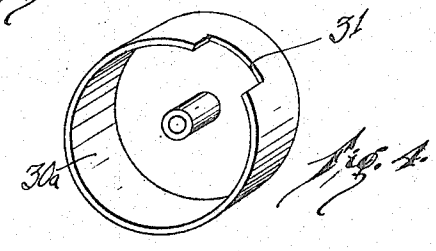

Fig. 4.

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UNITED STATES PATENT OFFICE.

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RATCHET DRIVE MECHANISM.

Original application filed October 18, 1921, Serial No. 506,741. Divided and this application filed August 6, 1923. Serial No. 656,035.

To all whom it may concern:

Be it known that I, JOHN F. HALVERSON, a citizen of the United States, and a resident of Madison, in the county of Dane and State of Wisconsin, have invented a new and useful Improvement in Ratchet Drive Mechanism, of which the following is a full, clear, and exact description.

My invention relates to improvements in ratchet drive mechanisms, and it consists in the combinations, constructions, and arrangements herein described and claimed.

An object of my invention is to provide a drive mechanism of the character described by means of which a belt or scroll may be wound from one roller to another, or reverse, and in which means is provided for holding the belt or the scroll taut at all times.

A further object of my invention is to provide a ratchet drive mechanism of the character described that is particularly well suited to the drive mechanism of an indicator belt in a street indicating device, such as may be used upon traction vehicles.

The present application is based upon my co-pending application for patent on street indicating device, Serial No. 506,741, filed October 18, 1921, and is a divisional part thereof. In this application the particular structure of my drive mechanism is disclosed but not claimed.

A further object of my invention is to provide a device of the character described in which means is provided for compensating the rotation of one roller relative to the other, due to the thickness of superimposed plies of the belt or scroll as they are wound upon the rollers.

A further object of my invention is to provide a device of the character described that is extremely simple in constructon, is not likely to get out of order easily, and which is thoroughly practical for the purpose intended.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings, forming part of this application, in which—

Figure 1 is a top plan view of an embodiment of my invention with a portion of the driven belt or scroll broken away.

Figure 2 is a sectional view along the line 2—2 of Figure 1,

Figure 3 is a sectional view along the line 3—3 of Figure 1, and

Figure 4 is a perspective view of a portion of the mechanism illustrated in Figure 1.

In carrying out my invention, I make use of a base 1, upon which a pair of upright supporting members 2 and 3 are fixed. The supporting members 2 and 3 are each provided with a pair of spaced apart inwardly extending bearing sleeves 3′ and 4, the sleeves 3′ on the wall 2 being in axial alinement with the sleeves 4 on the wall 3.

Shafts 5 and 6 are rotatably mounted in the bearing members 3′ and 4, and are arranged to extend beyond the outer face 7 of the upright supporting member 3. The outer ends of the shafts 5 and 6 are fashioned, as shown at 8, to fit an angular socket in a pair of rollers 9 and 10, respectively. The sockets are disposed on the axes of the rollers 9 and 10. The opposite ends of the rollers 9 and 10 are rotatably supported upon a suitable bearing member, not shown, and the rollers are therefore parallel with one another and in a single plane.

In the present embodiment of my invention I have shown a belt 11 which is disposed with its opposite ends secured to the rollers 9 and 10 respectively, and the belt 10 has imprinted thereon legends representing the names of streets. This embodiment of the invention is intended for use with a street indicating device as disclosed in my co-pending application aforementioned. It will be noted that the belt 11 must be wound upon one of the two rollers 9 and 10, or distributed between the rollers so that the portion of the belt intermediate the belts 9 and 10 is at all times taut.

Each of the shafts 5 and 6 has rotatably mounted thereon a gear wheel 12 and 13 respectively. Ratchet wheels 14 and 15 are fixed to the shafts 5 and 6 respectively, in close proximity to the gear wheels 12 and 13 respectively. Pivotally mounted pawls 16 and 17 are supported at 18 upon the gear wheels 12 and 13 respectively, so that their toothed portions 19 may engage with the

teeth 20 of the ratchet wheels 14 and 15. Each of the pawls 16 and 17 is provided with an arcuate slot 21 therethrough, and a pin 22 having a head portion is disposed through the slot 21 and supported upon the gear wheels 12 and 13 respectively, so that the extent of the movement of the pawls may be positively determined.

Means for driving the gear wheels 12 and 13 is provided in a shaft 23 which is rotatably mounted in bearing members 24 and 25 of the upright portions 2 and 3 respectively. A relatively large drive gear wheel 26 is carried by the shaft 23, and a relatively small pinion 27 is disposed upon the shaft 23. The pinion 27 is in mesh with the wheels 12 and 13 so that rotation of the shaft 23 will cause the gear wheels 12 and 13 to turn in opposite directions.

A fourth shaft 28 is rotatably mounted on the upright member 2. The shaft 28 is a stub shaft and the opposite end thereof is connected to an electric motor 29. The motor 29 is of a reversible type so that it may be driven forward or in reverse at the will of the operator, by a suitable switch mechanism (not shown).

Each of the bearing members 4 has rotatably supported thereon a shell 30^a and 30^b respectively. The shells 30^a and 30^b each have an angular recess 31 in the edge thereof. This recess 31 is sufficiently large to permit the movement of the shells 30^a and 30^b into close engagement with the gear wheels 12 and 13 respectively, the recess 31 receiving the pawls 16 and 17 of the gear wheels 12 and 13 respectively.

A band spring drag member 32 is carried by an inwardly projecting supporting member 33 secured to the wall 2. There are two of these members 32, one for each of the shell members 30^a and 30^b. The springs 32 are constantly held in yielding engagement with the shells so as to virtually place a drag upon the rotation of the shells.

Each of the gear wheels 12 and 13 is provided with a metal drum 34 and 35 respectively, which drums are disposed directly upon the shafts 5 and 6. A spring shoe 36 is provided for each of the drums 34 and 35 so as to serve as a drag against the rotation of the gear wheels 12 and 13.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. In operating my improved ratchet drive mechanism, it is merely necessary to actuate the electric motor 29 and the mechanism will automatically function so that the belt 11, carried by the rollers 9 and 10, may be wound from one roller to another, or reverse, and at all times be held in a taut condition.

Let us assume that it is wished to drive the belt 11 in the direction of the arrow 37. The operator in order to do this will actuate the switch mechanism, not shown, so that the electric motor 29 will rotate in the direction of the arrow 38. This is a counter clockwise direction. Rotation of the motor 29 will cause the drive pinion 39 to rotate with the shaft 28 and cause the drive gear 26 to rotate in a clockwise direction, since the pinion 39 is in mesh with the gear 26. Rotation of the gear 26 will of course occasion a similar movement of the pinion 27, since the gear 26 and the pinion 27 are on a common shaft.

The gear 12 will rotate in a counter clockwise direction and the gear 13 will rotate in a counter clockwise direction. As the gear 12 rotates in a counter clockwise direction, the shell 30^a adjacent the gear 12 will be somewhat retarded in its following movement of the gear by virtue of the spring 32, and the side walls of the recess 31 of the shell 30^a will contact with the pawl 16 and cause the pawl to be moved clear of the teeth 20 of the ratchet gear 14.

The gear 12 will therefore rotate freely upon the shaft 5 and only the spring shoe 36 in contact with the drum 34 will have any direct effect upon the movement of the shaft 5. The gear wheel 13, as it moves in a counter clockwise direction, will cause a like movement of the shell 30^b, and retardation of this movement will occasion the pawl 17 to be moved into engagement with the teeth 20 of the ratchet gear 15. This is clearly shown in Figure 2. The shaft 6 will therefore turn with the gear 13 and drive the roller 10 associated therewith in a counter clockwise direction and the belt 11 will be wound thereupon and moved in the direction of the arrow 37. The belt 11 will be taut since the spring shoe 36 is in constant yielding engagement with the drum 34 disposed on the shaft 5.

If it is desired to reverse the movement of the belt 11, it is merely necessary to reverse the direction of rotation of the motor 29 and the operation may be exactly reverse, the gear wheels each rotating in the same direction and the pawl 10 will then engage with the ratchet gear 14, while the pawl 17 will be disengaged from the ratchet gear 15.

I claim:

1. A clutch mechanism of the character described comprising a pair of shafts, a gear wheel rotatably mounted on each of said shafts, said gear wheels arranged to be driven both in the same direction, means for causing one of said gear wheels to grip and turn its associate shaft and to cause the other of said gear wheels to turn freely on its associate shaft when said gear wheels are driven in one direction, said means comprising a ratchet wheel associated with each of said shafts, a pawl associated with and mounted on each of said gear wheels, said

pawls being adapted for engagement with the adjacent ratchet wheels on said shafts, and shells loosely mounted on said shafts, spring pressed drag members in contact with said shells, said shells being arranged to engage with said pawls to move one of said pawls in engagement with its adjacent ratchet wheel, and the other pawl out of engagement with its adjacent ratchet wheel, depending upon the direction of rotation of said gear wheels.

2. A clutch mechanism of the character described comprising a pair of shafts, rollers directly connected with each of said shafts and in longitudinal alinement therewith, and a belt connected at its opposite ends upon said rollers respectively, and arranged to be wound from one roller to the other, depending upon the direction of rotation of said rollers, a gear wheel rotatably mounted on each of said shafts, said gear wheels arranged to be driven both in the same direction, means for causing one of said gear wheels to grip and turn its associate shaft and to cause the other of said gear wheels to turn freely on its associate shaft when said gear wheels are driven in one direction, said means comprising a ratchet wheel associated with each of said shafts, a pawl associated with and mounted on each of said gear wheels, said pawls being adapted for engagement with the adjacent ratchet wheels on said shafts, and shells loosely mounted on said shafts, spring pressed drag members in contact with said shells, said shells being arranged to engage with said pawls to move one of said pawls in engagement with its adjacent ratchet wheel, and the other pawl out of engagement with its adjacent ratchet wheel, depending upon the direction of rotation of said gear wheels.

JOHN F. HALVERSON.