March 23 , 1926. 1,577,770

S. J. STRID

GEARING

Filed Dec. 11 1925

Fig. 1

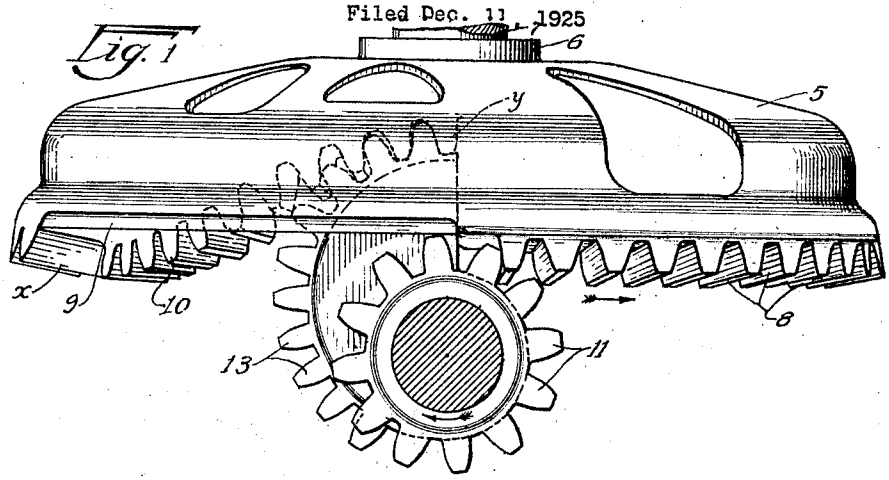
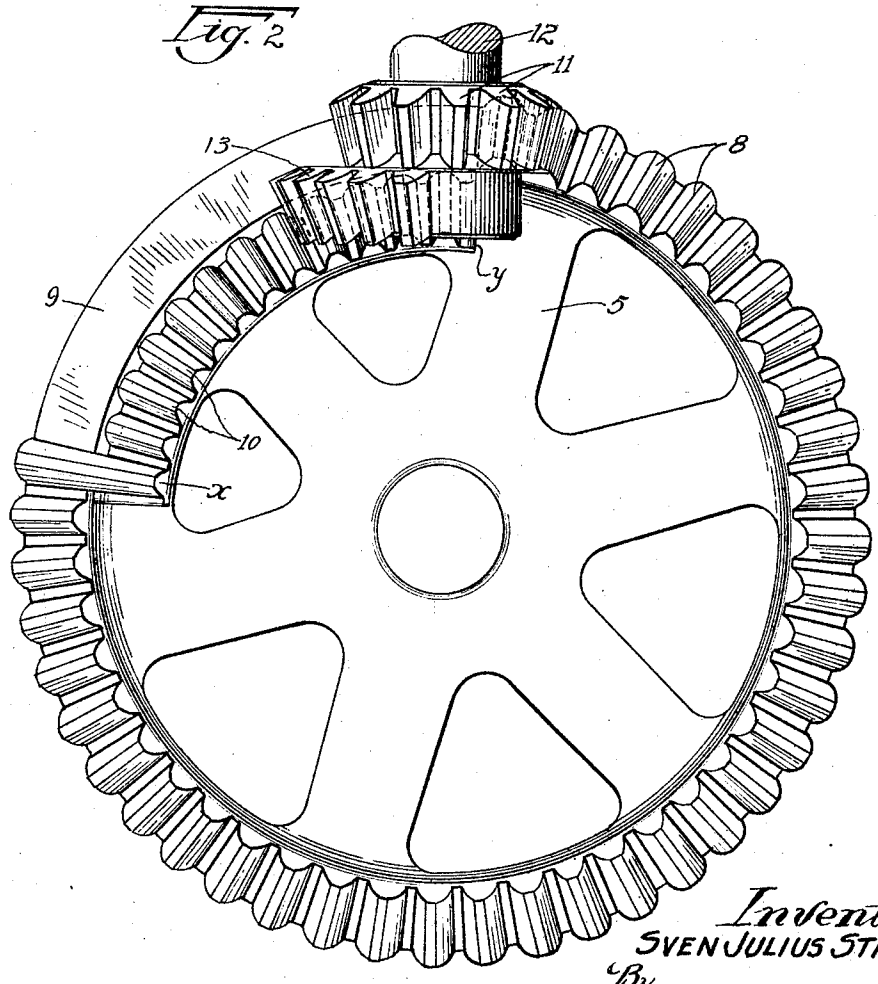


Fig. 2



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UNITED STATES PATENT OFFICE.

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GEARING.

Application filed December 11, 1925. Serial No. 74,745.

To all whom it may concern:

Be it known that I, SVEN JULIUS STRID, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, United States of America, have invented a new and useful Improvement in a Gearing, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to make and use the same.

My present invention relates to gearing. The particular applicability of the structure is in connection with the gearing employed in connection with the pull chain or rod of a brake mechanism used on railway cars.

The primary object of this invention resides in providing a gearing wherein the driving members are adapted to actuate the driven members at divers speeds. In this connection I have provided beveled gears that are rotatable upon axes disposed at an angle to each other (preferably a right-angle) and the gear members are so constructed and arranged that while the driving member is moved at a uniform speed the driven member will be actuated initially at a higher speed, but at a reduction of power than the subsequent speed which is at an increase of power. In carrying out my invention I employ a small gear or pinion that engages with a segmental gear, and coordinated with the pinion is a convolute or an eccentric gear with its teeth in a plane spaced from the teeth of the pinion. This convolute or eccentric gear is adapted to mesh with gear teeth stepped out of the plane of the teeth of the segmental gear and arranged in the form of a rack that is disposed spirally.

I prefer to carry out my invention and accomplish the objects thereof in substantially the manner hereinafter described and as more particularly pointed out in the claims, reference being here made to the accompanying drawings that form a part of this specification.

In the drawings:

Figure 1, is a top plan of my improved gearing showing the members in position for the initial movement.

Figure 2, is a vertical front elevation of the structure illustrated in Figure 1.

The drawings illustrate a typical or preferred embodiment of my invention and in the views I have employed similar reference characters to designate the same parts wherever they appear.

The driven member comprises a body 5 of concavo-convex or dished out form having a central hub 6 to which the driven shaft or spindle 7 is connected and upon the rim of this body I provide gear-teeth 5 of the beveled type that extend throughout the major portion of the rim so that a segmental gear is thereby provided upon approximately three-fourths of the rim. The portion of the rim between the end teeth is cut back and unbroken as at 9, the purpose will hereinafter more fully appear. Inside the rim I provide a secondary segmental gear 10 that extends between the terminal teeth at each end of the outer gear 8, and which is therefore shorter in extent than the outer segmental gear. The two gears 8 and 10 are formed upon curves that are concentric to each other being struck from the same center, with different radii as seen in Figure 2 of the drawings. The inner segmental gear 10 extends from the plane of the outer gear 8 at the point designated as x inwardly of the dished body 5 in somewhat of a spiral or convolute which terminates at the point y approximately opposite the other terminal of segmental gear 8, but back of the plane of said gear when viewed in Figure 1.

The driving member of the gearing consists of a beveled pinion or gear 11 mounted upon a spindle or shaft 12, the axis of which is preferably at a right-angle to the axis of the spindle or shaft 7 of the driven member and said pinion is adapted to engage the teeth of the outer segmental gear 8, and will clear the rim of the body 5 when moving in the cut-down portion 9 of the body. Extending from the hub, or formed as a segmental part and connected to pinion 11, or to the shaft 12, is an eccentric gear 13. This gear 13 is of segmental shape and may be formed upon a convolute or may be formed from one center and mounted so that its teeth are eccentric to the axis of the shaft 12 and the pinion 11. The eccentric gear 13 is adapted to mesh with the inner segmental gear 10 of the driven member as soon as the pinion 11 has disengaged the outer segmental gear 8 of the driven member. As noted in Figure 1, the portion of the gear 13, that is farthest from the axis of shaft 12, is adapted to engage that portion of the

inner segmental gear 10, nearest the point *y* of the driven member and during rotation in the direction of the arrows in Figure 1, the periphery of the eccentric gear 13, approaches the periphery of the beveled pinion 11 and will continue in engagement with the inner segmental gear 10, until the driven member has been rotated far enough to bring the point *x* opposite or alongside the pinion and the latter then continues in engagement with the outer segmental gear the desired distance and at a uniform speed. Due to the fact that the eccentric gear 13, at its greatest width engages the deepest portion of the segmental gear 10, the initial speed of the driven element is greater at this time than during the engagement of the pinion with the outer concentric gear, but the power created is at its minimum. This permits the use of the structure in connection with a railway car brake so that the slack in the pull chain of the latter, which requires very little power, may be taken up quickly, and thereafter the brake may be applied during the coaction of the pinion with the outer concentric gear and with increased power.

What I claim as new is:—

1. A gearing comprising two gear elements rotatable on axes at an angle to each other, one of said elements consisting of two segmental gear members formed upon concentric curves of different diameter and the second element consisting of a pinion member and a scroll gear member that engage the respective members of the first gear element.

2. A gearing comprising two gear elements rotatable on axes at an angle to each other, one of said elements consisting of an outer segmental gear member and an inner segmental gear member of less diameter and extending between the ends of the outer member, and the second element consisting of a pinion member and a scroll gear member that engage the respective members of the first gear element.

3. A gearing comprising driving and driven elements rotatable on axes at an angle to each other, the driven element consisting of a pair of segmental gears one of which is of less diameter than the other and extends between the terminal teeth thereof, and both of said gears being concentric to the axis of rotation of the driven element, and the driving element consisting of a pinion and a segmental gear mounted upon the same spindle, said pinion and segmental gear being respectively concentric and eccentric to the axis of rotation of said driving element and adapted to engage the respective parts of the driven element.

4. A gearing comprising a driving and a driven element the rotation axes of which are at right-angle to each other, the driven element consisting of two segmental gear members formed upon curves of different diameters and the segmental member of smallest diameter being curved away from the plane of the other member, and the driving element consisting of a pinion and a scroll gear that engage the respective members of the driving element.

5. A gearing comprising a driving and a driven element the rotational axes of which are at a right-angle to each other, the driven element consisting of a dished member, a fractional portion of the rim of which is toothed, a segmental set of teeth within the rim of the dished member and extending throughout the untoothed portion of the rim and inwardly away from the plane of the rim, and the driving element consisting of a pinion and a toothed convolute flange stepped therefrom, said pinion and flange adapted to engage the respective portions of the driving element.

6. A gearing comprising a dished member having teeth upon a fractional portion of the rim thereof, row of teeth extending intermediate the ends of the first mentioned teeth and stepped back of the plane thereof and extending in an inwardly described spiral, a pinion adapted to engage the teeth on the rim of said dished member, a scroll gear adapted to engage with the intermediate teeth on said dished member, a spindle upon which a dished member is mounted, and a second spindle disposed at right-angle to the first spindle upon which said pinion and scroll gear are mounted the one beyond the other.

Signed at Chicago, in the county of Cook, and State of Illinois, this fourteenth day of October, 1925.

SVEN JULIUS STRID.