No. 751,787. PATENTED FEB. 9, 1904.

J. C. ENTRIKEN.

REVERSING GEAR.

APPLICATION FILED APR. 6, 1903.

NO MODEL.

Fig. 1.

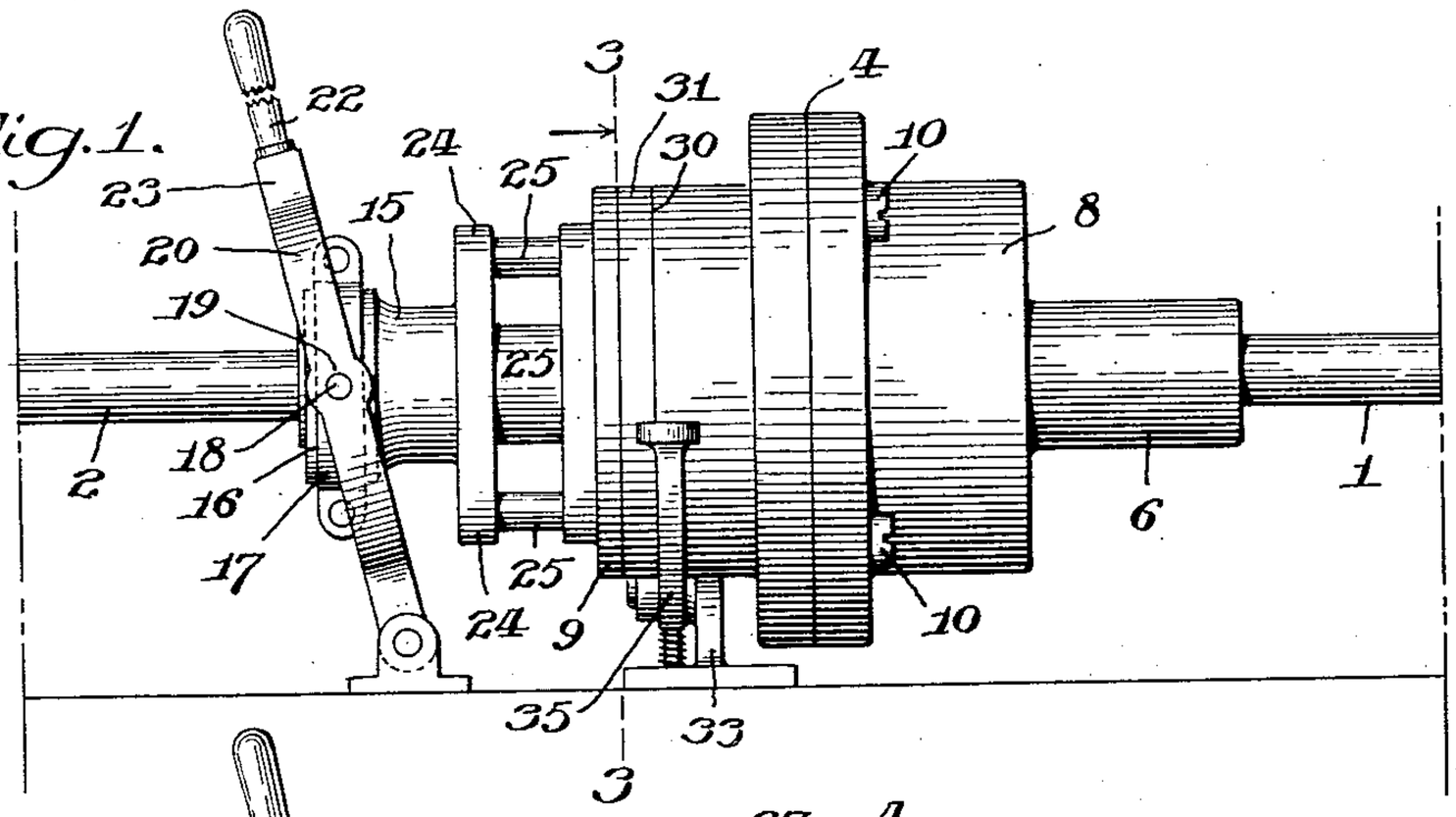


Fig. 2.

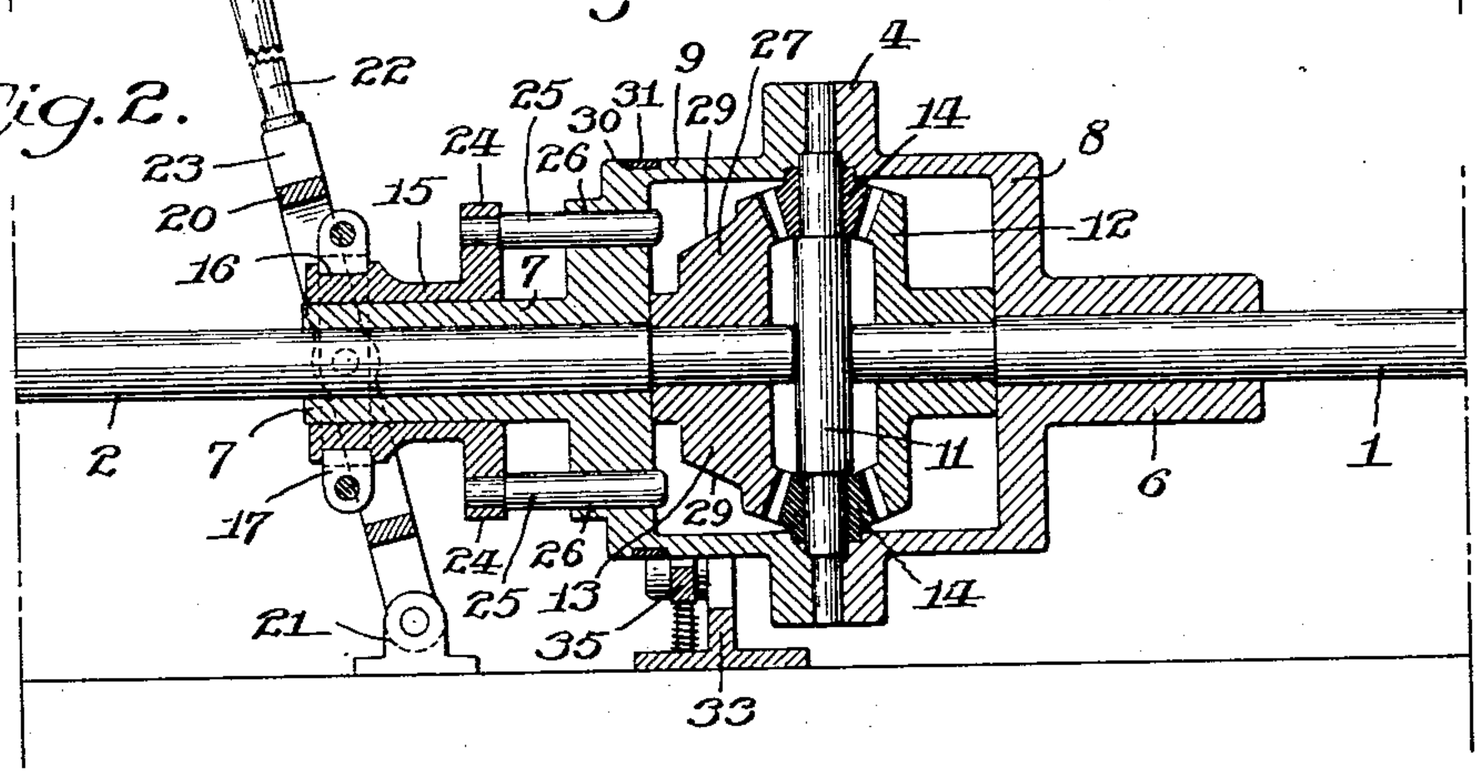


Fig. 3.

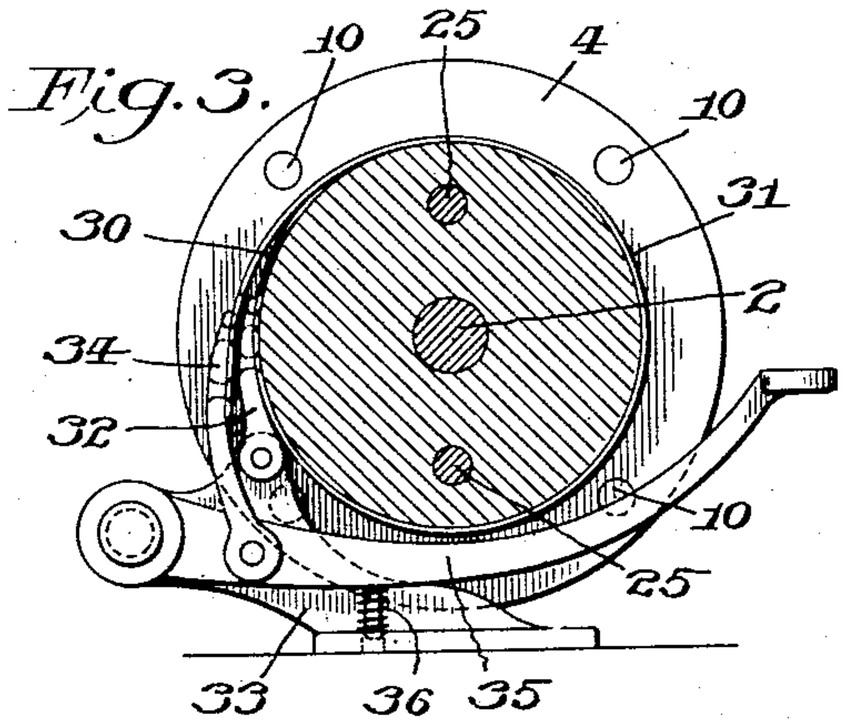


Fig. 4.

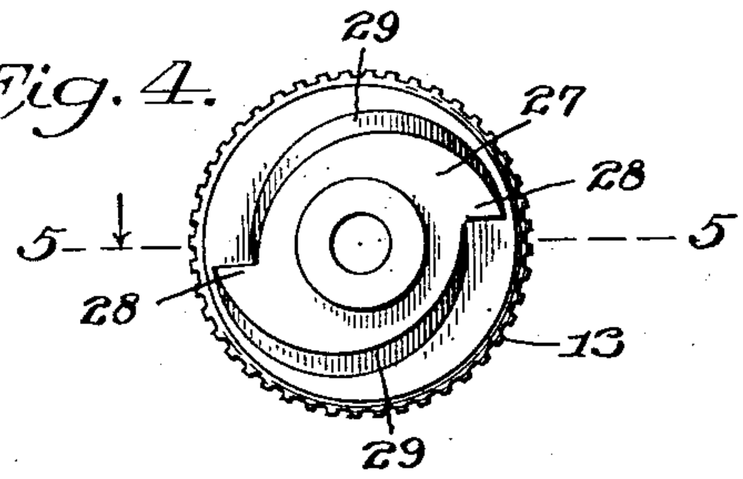
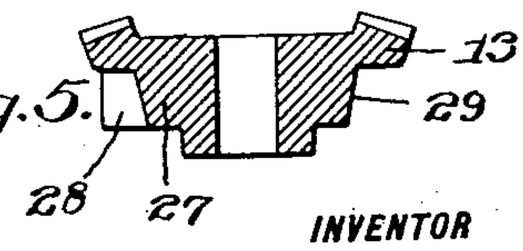


Fig. 5.



WITNESSES:

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No. 751,787. Patented February 9, 1904.

UNITED STATES PATENT OFFICE.

JOHN C. ENTRIKEN, OF MALVERN, PENNSYLVANIA, ASSIGNOR TO HIMSELF, GEORGE R. WALTON, J. CARROLL ENTRIKEN, AND WILLIAM S. EVERETT, OF MALVERN, PENNSYLVANIA.

REVERSING-GEAR.

SPECIFICATION forming part of Letters Patent No. 751,787, dated February 9, 1904.

Application filed April 6, 1903. Serial No. 151,250. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. ENTRIKEN, a citizen of the United States, residing at Malvern, in the county of Chester and State of Pennsylvania, have invented certain new and useful Improvements in Reversing-Gears, of which the following is a specification.

This invention relates to reversing-gears, its object being to provide a simple, inexpensive, and efficient construction whereby a driving member may be connected to a driven member, so that the latter will be positively rotated with the driving member, whereby the driving member may be connected to the driven member, so that the latter will be driven in a reverse direction to that of the driving member, and whereby the driving member may be disconnected from the driven member so that the latter will remain idle during the actuation of the driving member.

The invention consists in the novel construction and combinations of parts, which will be hereinafter fully described and claimed.

In the drawings, Figure 1 is a side elevation of my improved reversing-gear. Fig. 2 is a longitudinal vertical section thereof. Fig. 3 is a transverse vertical section as on the line 3 3 of Fig. 1. Fig. 4 is an elevation of one of the gear-wheels, showing the inclined friction-surfaces thereon. Fig. 5 is a sectional detail as on the line 5 5 of Fig. 4.

1 and 2 designate the respective members of a two-part shaft, either one of which may be connected to any suitable source of power and constitute the driving member. This shaft may be journaled in any suitable bearings, which may be located near or away from the reversing-gear, as occasion may require, it being unnecessary to provide any bearings near the respective ends of the shaft to support the latter in line with each other, as the frame or casing 4 of the reversing-gear is supported by the ends of the shaft and extends rigidly between the same, the frame or casing 4 being provided with hubs or bearings 6 and 7, in which the members 1 and 2 are rotatably mounted, respectively. This is an important feature of my invention, as it keeps the members 1 and 2 in perfect alinement without the need of any fixed bearings adjacent to the casing.

The frame or casing 4 is preferably made in two parts 8 and 9, as shown, which are rigidly held together by means of screws or bolts 10.

The ends of the members 1 and 2 do not extend to meet each other, and they are intersected by a shaft 11, which is mounted in and extends through the frame or casing 4.

Fixed to the opposing ends of the members 1 and 2 of the shaft and located within the casing 4 are bevel gear-wheels 12 and 13, respectively, each of which meshes with a pair of interposed gear-wheels 14, which are rotatably mounted on the shaft 11.

The hub 7 of the casing 4 has slidingly fitted thereto a sleeve 15, which is provided with a circumferential groove 16, in which is arranged a collar 17, provided with pins 18, which project into slots 19 in a yoke-frame 20. This yoke-frame 20 is pivoted at one end to a suitably-located fixed bracket 21, and it is provided on its other end with a handle 22, thereby constituting a lever 23, by means of which the sleeve 15 may be moved toward or away from the casing 4, as desired.

The sleeve 15 is provided with arms 24, from which project a pair of oppositely-disposed pins 25, which extend through openings 26 in the casing 4 and which are adapted to engage the bevel gear-wheel 13 with or disengage it from the said casing in the following manner:

The gear-wheel 13 is provided with a raised portion 27, which constitutes a pair of oppositely-disposed teeth 28 and a pair of oppositely-disposed inclined friction-surfaces 29, connecting the teeth 28 together. Each friction-surface 29 gradually curves inwardly from the point of one tooth 28 to the base of the opposite tooth 28, thereby extending from a point outside of the path through which the pins 25 travel, which is the point of one of the teeth 28, to a point inside of the path through which the pins 25 travel, which is the base of the opposite tooth 28. Thus it will be seen that if either the casing 4 or the

gear-wheel 13 be idle and the other rotating and if the pins 25 be moved toward the gear-wheel 13 the said pins will engage the inclined surfaces 29 and gradually moving down the latter will gradually start the idle member by frictional engagement until the pins 25 and teeth 28 meet, whereupon the previously idle member will be positively driven by the rotating member.

The casing 4 is provided with a circumferential groove 30, in which is arranged a friction-strap 31, one end of which is connected to an arm 32, projecting upwardly from a suitably-arranged bracket 33, the lower end of the arm 32 being pivoted to the bracket 33. This strap 31 extends entirely around the groove 30 and is connected at its other end to the upper end of an arm 34, which is arranged adjacent to the arm 32. The lower end of the arm 34 is pivotally connected to a lever 35, which is pivoted to the bracket 33, as shown. By moving the lever 35 away from the casing 4 the strap 31 will be drawn tightly around the groove 30 and the casing effectually locked against rotation for a purpose hereinafter explained. By connecting the ends of the strap 31 to the pivoted arms 32 and 34, as shown, I am enabled to get a close contact of the strap 31 with the groove 30 for a great portion of its length, for the reason that when the lever 35 is moved away from the casing the upper end of the arm 32 will be drawn toward the casing 4, thereby firmly pressing the inner end of the strap 31 against the latter, and the arm 34 will be drawn against the arm 32.

The lever-arm 35 is held normally toward the casing 4 by the action of a suitable spring 36.

Assuming that the member 1 of the two-part shaft is the driving member and that the member 2 is the driven member, the operation of the device is as follows: When the driving member 1 is rotating and the driven member 2 is idle, the parts occupy the positions shown in the drawings—that is to say, the pins 25 are withdrawn from the bevel gear-wheel 13 and the strap 31 hangs loosely in the groove 30 and the gear-wheel 12, fixed to the rotating driving member 1, merely rotates the gear-wheels 14, which roll around the gear-wheel 13 and carry the casing 4, which rotates at a slower rate of speed than that of the driven member 2, the member 2 being locked against rotation by the load thereon. When it is desired to connect the member 2 by frictional engagement to the rotating driving member 1, so as to drive said members together and in the same direction, the lever 23 is moved to engage the pins 25 with the gear-wheel 13, during which operation the pins 25 will engage the inclined surfaces 29, and gradually moving down the latter will gradually start the idle member 2 until the pins 25 engage the teeth 28, whereupon the casing 4 ceases to rotate around the gear-wheel 13, the members 1 and 2, the casing 4, and the gear-wheels 12, 13, and 14 become locked together as a unit, and the member 2 is positively rotated in the same direction as and by the member 1, and when it is desired to drive the member 2 in a reverse direction to that of the driven member 1 the pins 25 are withdrawn from engagement with the teeth 28, and the lever-arm 35 is moved away from the casing 4 to draw the friction-strap 31 tightly around the groove 30, whereupon the casing 4 and, perforce, the shaft 11 gradually cease their rotation, the gear-wheels 14 gradually start to rotate the gear-wheel 13 and driven member 2 in a direction opposite to the direction of rotation of the driving member 1, and when the casing 4 ceases to rotate and is held against rotation by the strap 31 the gear-wheels 14, being driven by the gear-wheel 12, will positively rotate the driven member 2 contrary to the direction of rotation of the driving member 1.

I claim—

1. In a reversing-gear, the combination of a two-part shaft, gear-wheels on the opposing ends thereof, a frame rotatably mounted on the shaft, a gear-wheel rotatably mounted on the frame and meshing with said gear-wheels, a pin carried by said frame, a tooth on one of the first-named gear-wheels, and means for engaging said pin with said tooth.

2. In a reversing-gear, the combination of a two-part shaft, gear-wheels on the opposing ends thereof, a frame rotatably mounted on the shaft, a gear-wheel rotatably mounted on the frame and meshing with the first-named gear-wheels, a movable sleeve, a pin carried by said sleeve and engaging said frame, a tooth on one of the first-named gear-wheels, and means for moving said sleeve to engage the pin with the tooth.

3. In a reversing-gear, the combination of a two-part shaft, gear-wheels on the opposing ends thereof, one of said gear-wheels being provided with an inclined friction-surface and a tooth, said friction-surface leading to said tooth, a frame rotatably mounted on the shaft, a gear-wheel rotatably mounted on the frame and meshing with said gear-wheels, a pin carried by said frame and arranged in line with said friction-surface and tooth, and means for moving said pin into engagement with said friction-surface and tooth.

4. In a reversing-gear, the combination of a two-part shaft, gear-wheels on the opposing ends thereof, one of said gear-wheels being provided with an inclined friction-surface and a tooth, said friction-surface leading to said tooth, a frame rotatably mounted on the shaft, a gear-wheel rotatably mounted on the frame and meshing with said gear-wheels; a movable sleeve, a pin carried by said sleeve and engaging said frame, and means for moving said sleeve to engage the pin with the friction-surface and tooth.

5. In a reversing-gear, the combination of

a two-part shaft, gear-wheels on the opposing ends thereof, one of said gear-wheels being provided with a pair of oppositely-disposed teeth and a pair of oppositely-disposed inclined friction-surfaces, said friction-surfaces leading to said teeth, a frame rotatably mounted on the shaft, a gear-wheel rotatably mounted on the frame and meshing with the first-named gear-wheels, a pair of oppositely-disposed pins arranged in line with said friction-surfaces and teeth, and means for moving said pins into engagement with said friction-surfaces and teeth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN C. ENTRIKEN.

Witnesses:
ANDREW V. GROUPE,
RALPH H. GAMBLE.