

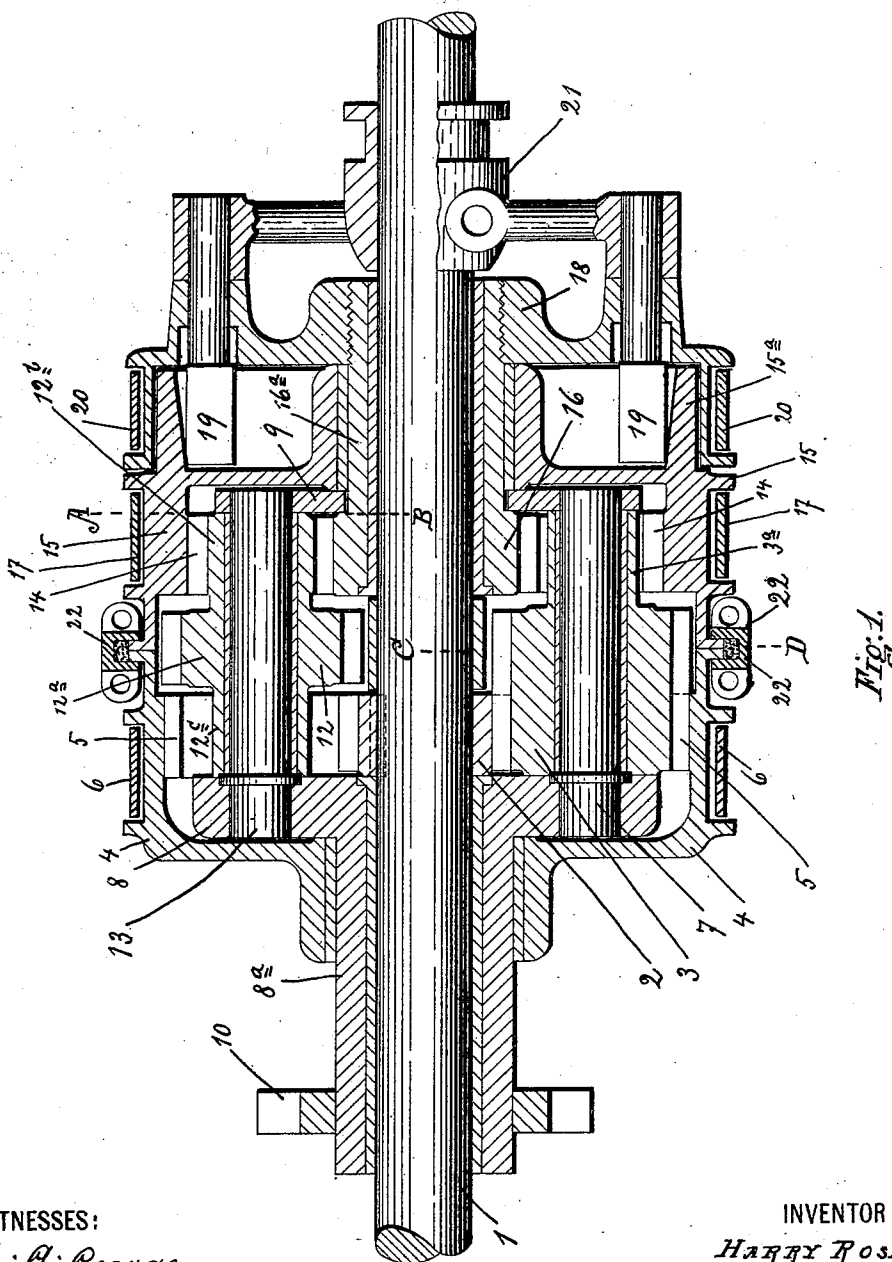
No. 694,197.

Patented Feb. 25, 1902.

H. ROSE.
TRANSFORMING GEAR.
(Application filed June 10, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:
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Morris P. Richards

INVENTOR
HARRY ROSE.
BY *Milton Robinson*

ATTORNEY

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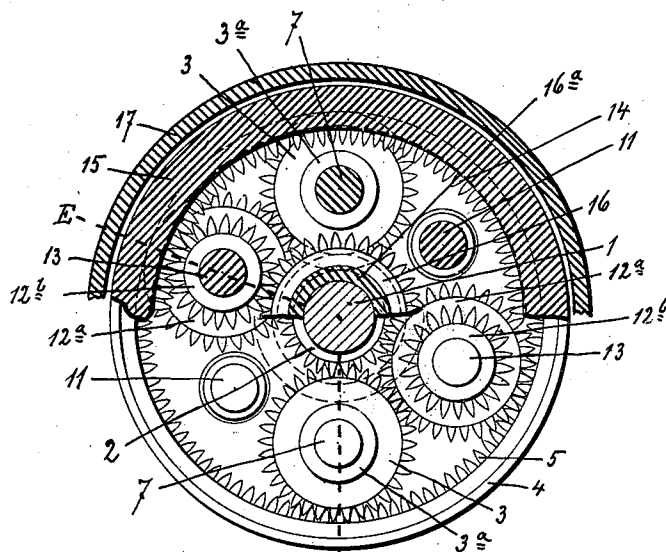


Fig. 2. I

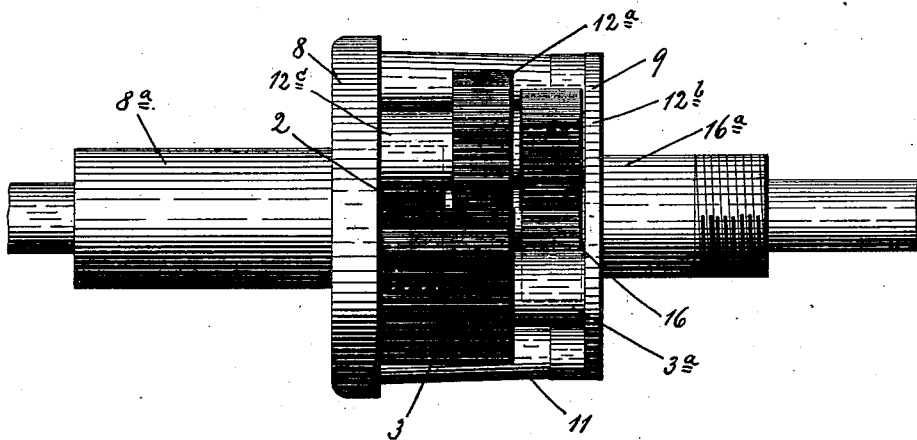


Fig. 3.

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HARRY ROSE, OF UTICA, NEW YORK.

TRANSFORMING-GEAR.

SPECIFICATION forming part of Letters Patent No. 694,197, dated February 25, 1902.

Application filed June 10, 1901. Serial No. 63,854. (No model.)

To all whom it may concern:

Be it known that I, HARRY ROSE, of Utica, in the county of Oneida and State of New York, have invented certain new and useful
5 Improvements in Transforming-Gears; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the
10 same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form part of this specification.

The object of my present invention is to
15 provide a transforming-gear which is simple and compact in construction and practical and feasible and particularly adapted for use in automobiles.

Figure 1 of the drawings shows a longitudinal section, taken on a line with E F of Fig. 2, of the transforming-gear. Fig. 2, as to its upper portion, shows a section taken on line A B of Fig. 1, and as to its lower portion a face view, all of the parts except the gears at the right of line C D of Fig. 1 being removed.
25

Referring to the reference-figures in a more particular description, 1 indicates the shaft to which the power is applied as the device is preferably used, although the power may be
30 taken from this shaft after being transformed, if desired. A gear-pinion 2 is secured to the shaft 1 by a key or otherwise. The teeth of gear 2 mesh with those of planet-gear 3, two of which are employed in the construction,
35 as shown in the drawings. Surrounding the planet-gears and inclosing them at least in part is a rotatable casing 4, having internal teeth 5, meshing with the teeth of planet-gear 3 as to a portion of their toothed face. The
40 casing 4 has on its exterior a brake-face adapted to receive the band-brake 6, and when applied the brake 6 secures the casing 4 from rotation. The planet-gears 3 are mounted on bearings 7, which bearings as to
45 one end are supported in disk 8 and as to the other end in plate 9. The disk 8 is provided with a sleeve portion 8^a, which has a bearing on and is free to rotate on the shaft 1 and carries the sprocket-wheel 10. When power
50 is applied to the shaft after transforming, it is delivered at sprocket 10. In case the de-

vice is to be used in the reversed manner before suggested the power will then be applied through the sprocket 10. The disk 8 and the plate 9 are coupled together by posts or columns 11, and the planet-gears 3 are provided
55 with spacing-sleeve extensions 3^a, which enable them to fully occupy the space between the disk 8 and the plate 9 on the bearing 7. The planet-gears 3, as to the portion of their
60 extended faces which do not engage with teeth 5 of the casing, engage with and drive the combination supplemental planet-gears 12. The said gears 12 are a combination-gear, in that they have the enlarged tooth
65 portion 12^a, engaging with the planet-gears, and the reduced toothed portion 12^b. The gears 12 are mounted on a bearing 13, which is supported in said disk 8 and plate 9 the same as the bearing 7 of the planet-gears,
70 and gear 12 is also provided with a spacing-sleeve portion 12^c, occupying a position opposite the fixed pinion 2. The teeth of the reduced portion of supplemental planet-gear 12 engage both with the internal teeth 14 of
75 the supplemental casing 15 and with the teeth of the loose axial gear-pinion 16. The gear-pinion 16 is provided with a sleeve portion 16^a, which runs freely on the shaft 1, and the supplemental casing 15 runs freely
80 on the exterior of this sleeve 16^a. The casing 15 is provided with a friction-surface adapted to receive the band-brake 17, and when applied this brake serves to secure the casing from rotation. Mounted and secured on
85 the outer end of the sleeve 16^a is the clutch 18, which completely incloses its end of the device and carries the clutch members 19 and is provided with a friction-surface adapted to receive the band-brake 20. This band-brake
90 when applied operates to secure particularly the loose axial gear 16 from rotation. The clutch members 19 are adapted to engage with the supplemental casing 15 at the frictional face 15^a and couple or connect the casing 15
95 to the clutch 18. The clutch members 19 are operated from the sliding collar 21 on the shaft. A grooved ring 22 receives the flanged ends of the casing 4 and supplemental casing 15 and serves to cover the joint and exclude foreign
100 matters. A packing, as shown, may be employed in the groove of the ring.

The operation of the device is substantially as follows: Power being applied to shaft 1, gear 2 is positively rotated in a certain direction. Gear 2, meshing with planet-gear 3, drives or tends to rotate it in the opposite direction. Planet-gear 3, meshing also with the teeth 5 of casing 4, causes casing 4 to rotate in the opposite direction from the shaft 1, and the power is lost at this point, or, in other words, no power is transmitted to the sprocket-wheel 10, and, in fact, the mechanism is out of gear, although parts are performing idle movements. When the band-brake 6 is applied to secure the casing or shell 4, then the planet-gears travel around the shaft in the same direction as the shaft travels at a reduced speed, and this movement is communicated to sprocket-wheel 10, which in the construction as shown will make one revolution to about three of the shaft. The brake 6 may be released and the brake 17 applied to hold the casing 15, then pinion 2 drives pinion 3 in the reverse direction. Pinion 3 drives 12 in the same direction as shaft, and 12, engaging with stationary teeth 14, the pinion 12 with connecting parts up to sprocket 10 move around the shaft in the reverse direction to its direction of rotation at a greatly-reduced speed, in which the relative sizes of parts 12^a and 12^b of gear 12 are factors. In this last-described transformation the casing 4 and axial gear 16, with connected parts, will run idly. When brake 17 is released and 20 applied to secure from rotation particularly the axial gear 16, then the smaller portion of combination supplemental planet-gear 12, engaging with said gear 16, causes the gear 12, with its connecting parts up to and including sprocket 10, to travel in the same direction as the shaft at a speed reduced from that of the shaft, but at a speed much faster than the reversed motion last described, as appears by a comparison of the number of teeth on the periphery of gear 16 with the number of internal teeth 14 on the shell 15. In this last-described combination the shell 15 runs idly. When the clutch parts 19 are thrown into operation, the part 18 is coupled to the part 15, and the result is that the gear 12 is held from rotation by reason of the teeth 14 engaging with one side and the teeth of pinion 16 engaging with the other. Rotation of the gears 12 and 3 being prevented, the application of power from gear 2 is transmitted directly to the sprocket 10 without any change in speed whatever. In this last-described connection all parts revolve around the shaft either by being directly coupled into connection or by their own frictional contact with moving parts, except the band-brakes.

In the drawings I have illustrated bushings for each bearing, as is clear from the inspection of the drawings, particularly Fig. 1, and special reference thereto and indication thereof may be omitted.

A gear-pinion, plain band-pulley, or other

means of transmission might be substituted for sprocket 16.

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

1. In a transforming-gear the combination of a shaft, a gear fixed thereon, a planet-gear meshing therewith, a rotatable disk carrying the planet-gear, a sprocket-wheel connected to said disk, a rotatable internally-toothed shell engaging with said planet-gear, a brake therefor, a supplemental planet-gear meshing with said planet-gear and mounted on said disk, a second or supplemental shell having internal teeth engaging with said supplemental planet-gear and a brake therefor, substantially as set forth.

2. In a transforming-gear the combination of the shaft, a gear fixed thereon, a planet-gear meshing therewith, a rotatable disk carrying the planet-gear, a sprocket-wheel connected to said disk, a rotatable internally-toothed shell engaging with said planet-gear, a brake therefor, a supplemental planet-gear meshing with said planet-gear and mounted on said disk, a second or supplemental shell having internal teeth engaging with said supplemental planet-gear, a brake therefor, an axial gear engaging with said supplemental gear and a brake therefor, substantially as set forth.

3. In a transforming-gear the combination of a shaft, a gear fixed thereon, a planet-gear meshing therewith, a rotatable disk carrying the planet-gear, a sprocket-wheel connected with said disk, a supplemental planet-gear meshing with said planet-gear and mounted on said disk, a rotatable casing having internal teeth engaging with said supplemental planet-gear, a brake therefor, a free-running axial gear engaging with said supplemental gear and a brake therefor, substantially as set forth.

4. In a transforming-gear the combination of a shaft, a gear fixed thereon, a planet-gear meshing therewith, a rotatable disk or support for said planet-gear and a sprocket-gear connected therewith, a supplemental planet-gear meshing with said planet-gear and mounted on said rotatable disk, said supplemental gear having a reduced toothed gear portion, a rotatable shell having internal teeth engaging with said reduced portion of said supplemental planet-gear, a brake for securing said shell, a free-running, axial gear also engaging with said reduced portion of the supplemental gear and a brake therefor, substantially as set forth.

5. In a transforming-gear the combination of a shaft, a gear fixed thereon, a planet-gear meshing therewith, a rotatable disk carrying planet-gear, a sprocket-wheel connected therewith, a rotatable internally-toothed shell engaging with said planet-gear, a brake therefor, a supplemental planet-gear meshing with said planet-gear and having a reduced gear portion, a second internally-toothed rotatable

5 casing engaging with said reduced portion of gear, a brake therefor, a free-running axial gear meshing with said reduced portion of supplemental gear, a brake therefor and a clutch for securing said portion of shell or casing and said axial gear together, substantially as set forth.

In witness whereof I have affixed my signature, in presence of two witnesses, this 3d day of June, 1901.

HARRY ROSE.

Witnesses:

E. WILLARD JONES,
S. A. BROWN.