Aug. 12, 1930. J. R. DUNHAM 1,772,986

SILENT STEEL GEAR

Filed Sept. 13, 1929

Fig. 1.

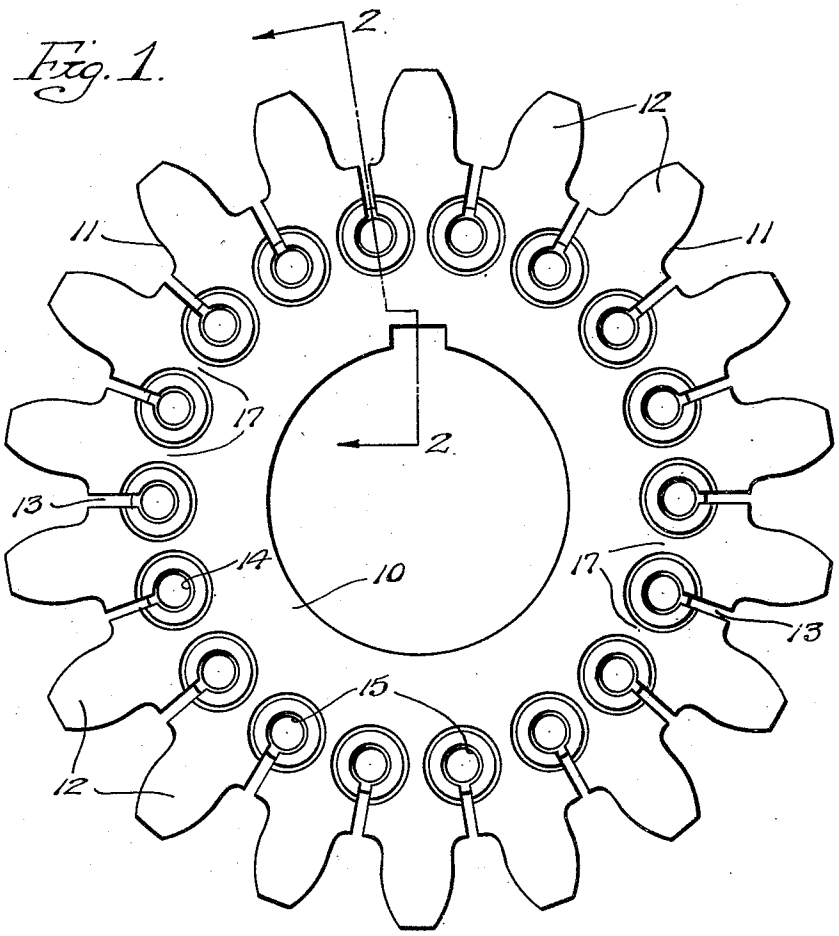
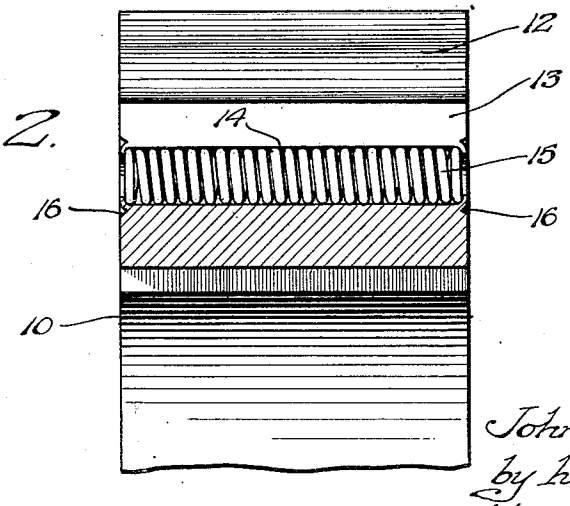



Fig. 2.




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Patented Aug. 12, 1930 1,772,986

# UNITED STATES PATENT OFFICE

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## SILENT STEEL GEAR

Application filed September 13, 1929. Serial No. 392,440.

This invention relates to gears, and more particularly to the producton of a gear blank providing a gear which will be silent in operation.

An important object of the invention is the production of a silent gear from a solid gear blank.

A further and more specific object of the invention is the production of a gear blank which, by slotting of the blank between adjacent teeth, permits the teeth to flex and thus provides a gear which is substantially noiseless in operation.

A still further object of the invention is to provide a construction of this character permitting the use of spring elements to reinforce the teeth so that the actual metallic support for the teeth provided in the blank may be reduced to a point otherwise impossible.

These and other objects I attain by the construction shown in the accompanying drawings wherein, for the purpose of illustration, I have shown a preferred embodiment of my invention and wherein:

Fig. 1 is a side elevation of a gear constructed in accordance with my invention; and

Fig. 2 is a fragmentary vertical sectional view therethrough.

Referring now more particularly to the drawings, the numeral 10 generally indicates a metallic blank, the periphery of which has been transversely slotted at 11 to produce gear teeth 12. From the bottoms of the slots 11 radial slots 13 are extended inwardly into the body of the blank, the inner ends of these slots being preferably enlarged as indicated at 14. A convenient method of producing the slots 13 and their enlargements is to transversely bore the blank 10 and then connect each transverse bore with the corresponding slot 11 by a saw kerf. Springs are preferably disposed within the slots 13 and more particularly within the enlargements 14 thereof. These springs may constitute any reslient insert in the enlargement 14 of the slots, being at present illustrated as coil springs which are placed in the bores and held in position therein by displacing the metal about the ends of the bores as indicated at 16.

In a construction of this character the enlargements 14 of the slots produce weakened portions 17 permitting the gear teeth 12 to independently flex in the line of rotation of the gear. The spring means disposed in the enlargements of the slots provide a reinforcement permitting the actual metallic web formed at 17 to be reduced to a point otherwise impossible. Where coil springs 15 as illustrated are employed in the bores the constriction of the spring resulting from flexure of the teeth will set up a torsional resistance to flexure while the generally cylindrical form of the spring will provide a novel and efficient support for the walls of the enlargement of the slot. It will of course be understood that the kerfs and bores producing the slots 13 and their enlargements 14 will follow the angle of the teeth of the gear.

Since the construction illustrated is capable of a certain range of change and modification without departing from the spirit of my invention, I do not wish to be understood as limiting myself thereto except as hereinafter claimed.

I claim:

1. A gear comprising a metallic blank having its periphery slotted to produce gear teeth and having radial slots extending inwardly from the base of the teeth forming slots, and a resilient element disposed in the inner end of each slot.

2. A gear comprising a metallic blank having its periphery slotted to produce gear teeth and having radial slots extending inwardly from the base of the teeth forming slots, the inner ends of said slots being enlarged to reduce the metallic web therebetween, and a resilient element disposed in the enlargement of each slot.

3. A gear comprising a metallic blank having its periphery slotted to produce gear teeth, there being a bore extending through the blank inwardly of and in alignment with each peripheral slot, a kerf connecting each bore with the bottom of the associated slot and separating the metal of the blank between the bore and the slot, and a resilient element disposed in each bore.

4. A gear comprising a metallic blank hav-

ing its periphery slotted to produce gear teeth, there being a bore extending through the blank inwardly of and in alignment with each peripheral slot, a kerf connecting each bore with the bottom of the associated slot and separating the metal of the blank between the bore and the slot, and a coil spring disposed within and fitting each bore.

5. A gear comprising a metallic blank having its periphery slotted to produce gear teeth, there being a bore extending through the blank inwardly of and in alignment with each peripheral slot, a kerf connecting each bore with the bottom of the associated slot and separating the metal of the blank between the bore and the slot, and a coil spring disposed within and fitting each bore, the metal of the blank at the ends of the bores being displaced to maintain the springs in position.

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