Sept. 14, 1937. E. H. MacCOUL 2,092,888

BACKLASH ELIMINATOR

Filed March 21, 1936

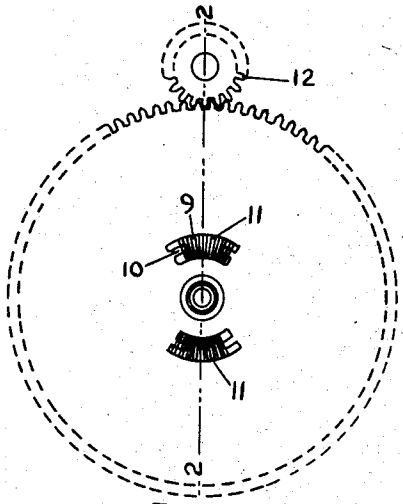


FIG. 1

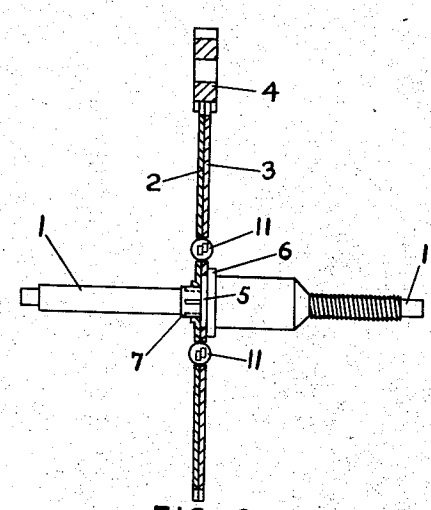


FIG. 2

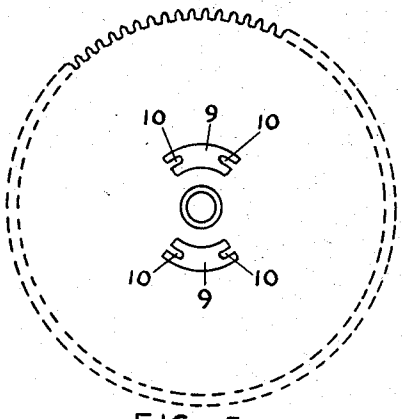


FIG. 5

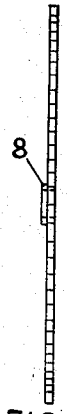


FIG. 6

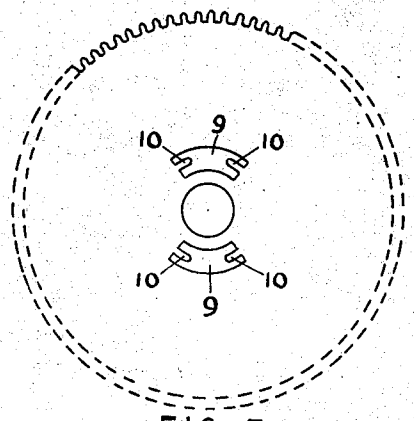


FIG. 7

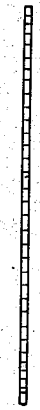


FIG. 8

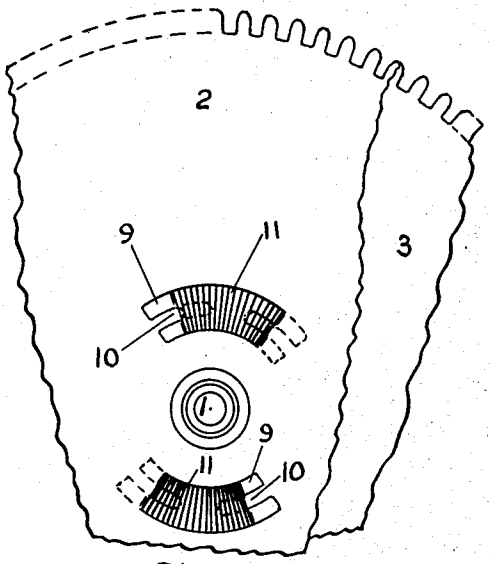


FIG. 3

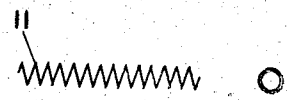


FIG. 9

FIG. 10

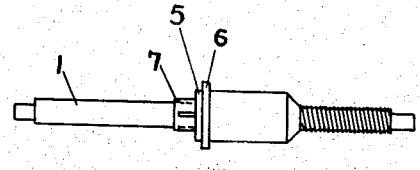


FIG. 4

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BACKLASH ELIMINATOR

Edward H. MacCoul, Thomaston, Conn., assignor to Seth Thomas Clock Company, Thomaston, Conn., a corporation of Connecticut

Application March 21, 1936, Serial No. 70,014

9 Claims. (Cl. 74—440)

My invention relates to back lash eliminators and has for its object the production of a device for this purpose which occupies a minimum of axial space, is extremely simple, easy to assemble and inexpensive to produce and decidedly positive in its action in the elimination of back lash in gear trains where great accuracy is required such as those used in clock movements for driving charts and the like.

I accomplish these objects by the means shown in the accompanying drawing in which:

Fig. 1 is a side view of my back lash eliminator.

Fig. 2 is a cross sectional view along a line 2—2 of Figure 1 having the shaft not shown in cross section.

Fig. 3 is an enlarged partial view of the parts shown in Figure 1.

Fig. 4 is a separate view of the shaft portion of my back lash eliminator.

Fig. 5 is a side view of the stationary gear member which is rigidly mounted on the shaft shown in Figure 4.

Fig. 6 is an end view of the gear member shown in Figure 5.

Fig. 7 is a side view of yielding gear member of my back lash eliminator which is journaled on the shaft shown in Figure 4.

Fig. 8 is an end view of the gear member shown in Figure 7.

Fig. 9 shows one of the resiliently or yielding member spiral spring members used to keep the proper tension between the gear members.

Fig. 10 is an end view of Figure 9.

Similar numerals represent the same parts throughout the several views.

In the drawing 1 represents a shaft having the plurality of shoulders 5, 6 and 7 shown. Journaled on the shouldered part 5 is a gear wheel 3 which is held in its rotating sidewise position by the larger shoulder 6 on one side of said wheel 3 and the other side of said wheel 3 by a similarly constructed gear wheel 2 which is rigidly mounted on a bushing 8 which is rigidly mounted on the special shoulder 7 of said shaft 1. The gear wheel 3 is thus free to rotate on the shaft 1 while the gear wheel 2 rotates with the shaft 1.

The gear wheels 2 and 3 in addition to the regularly centrally disposed apertures each have a plurality of elongated concentrically disposed apertures 9 each of which has a substantially centrally disposed tongue or projection 10 at each of the ends of said apertures, as shown. The said apertures in the wheels 2 and 3 being similarly positioned such that when the wheels are mounted on the shaft 1, as above set forth, they will register with each other as shown in Figures 1 and 3. When the apertures 9 in said gear wheels 2 and 3 are thus brought into the position of registration a substantially long spiral spring 11 of suitable diameter is compressed and inserted in said aperture 9 and released and allowed to expand so that the interior opening in the coil being sufficiently large will pass over and onto the tongues 10 which tongues 10 and the sides of the aperture 9 hold each of the said springs 11 in its operative position.

It is evident any rotation of the journaled gear wheel 3 while the gear 2 on shaft 1 is held against rotation will immediately compress said spring 11 and thus create a pressure or force tending to keep the apertures 9 in position of registration. Now, if the gear wheels 2 and 3 are thus positioned further apart to further compress the spring 11 and the teeth of the gear wheels 2 and 3 are in this position put into mesh with a gear or pinion 12 as shown in Figure 1 it is seen that the teeth of gears 2 and 3 will grip the thus engaged teeth of the gear 12 so that the driving gear teeth will always be held against the engaged teeth of the driven gear. It is evident that this entirely eliminates any back lash between the driven gear 2 and the driving gear 12.

It is evident that both the gears 2 and 3 may be suitably journaled on the shaft 1 so that the combined gears can be used as an idler in a gear train between two other gears, instead of having one or the other of these gears fastened on the shaft and the remaining gear journaled thereon.

It is evident from the above that I have produced a back lash eliminator which is extremely simple and inexpensive to produce and to assemble and which is decidedly positive in its action.

It will be understood, of course, that while I have here shown one form of my back lash eliminator I do not wish to be limited to the exact form shown but desire to have it taken in a sense illustrative of any and all forms which come fairly within the scope of the appended claims.

I claim:

1. A back lash eliminator comprising a plurality of gear wheels journally mounted on a shaft, said wheels having one or more similar apertures, opposed spaced tongues in said apertures and coiled springs retained on said tongues in said apertures for supplying a restoring force whenever an angular displacement occurs between said wheels.

2. A back lash eliminator comprising a plurality of gear wheels each journally mounted side by side on a shaft, each of said wheels having

one or more substantially similar apertures, opposed spaced tongues in each of said apertures and a spiral spring compressed and positioned over said tongues of both of said wheels and thereby retained thereon, and tending to keep said members in registration with each other.

3. A back lash eliminator comprising a plurality of gear wheels mounted side by side on a shaft one of which is fastened to said shaft and the other journaled thereon, each of said wheels having one or more substantially similar apertures, opposed spaced tongues in each of said apertures and a spiral spring compressed and positioned over said tongues of both of said wheels and thereby retained thereon, and tending to keep said opposed members in registration with each other.

4. A back lash eliminator comprising a plurality of gear wheels each journally mounted side by side on a shaft, each of said wheels having one or more substantially similar concentric apertures, opposed spaced tongues in each of said apertures and a spiral spring compressed and positioned over said tongues of both of said wheels and thereby retained thereon, resiliently keeping said members in registration with each other.

5. A back lash eliminator comprising a plurality of gear wheels each journally mounted side by side on a shaft, each of said wheels having one or more substantially similar apertures, opposed spaced tongues in each of said apertures and resilient means positioned over said tongues of both of said wheels and thereby retained thereon, resiliently keeping said members in registration with each other.

6. A back lash eliminator comprising a plurality of gear wheels each journally mounted side by side on a shaft, each of said wheels having one or more substantially similar concentric apertures, opposed spaced tongues in each of said apertures and resilient means positioned over said tongues of both of said wheels and thereby retained thereon, resiliently keeping said concentric apertures in registration with each other.

7. A back lash eliminator comprising a shaft, a gear wheel having an aperture rigidly mounted on said shaft, an auxiliary gear wheel having a substantially similar aperture journally mounted on said shaft, opposed spaced tongues in the aperture of each of said wheels and co-acting resilient means positioned over the said tongues of both of said wheels and thereby retained thereon, resiliently keeping said members in registration with each other.

8. A back lash eliminator comprising a shaft, a gear wheel having an aperture rigidly mounted on said shaft, an auxiliary gear wheel having an aperture journally mounted on said shaft, opposed spaced tongues in the aperture of each of said wheels and co-acting resilient means positioned over the said tongues of both of said wheels resiliently keeping said members in registration with each other.

9. A back lash eliminator comprising a shaft, a gear wheel having an aperture rigidly mounted on said shaft, an auxiliary gear wheel having a substantially similar aperture journally mounted on said shaft, opposed spaced tongues in the aperture of each of said wheels and co-acting resilient means positioned over and around the said tongues of both of said wheels and exerting a substantial force between the teeth of said wheels when said opposed members are not in registration with each other.

EDWARD H. MacCOUL.