

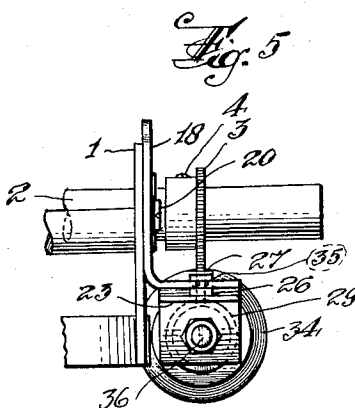
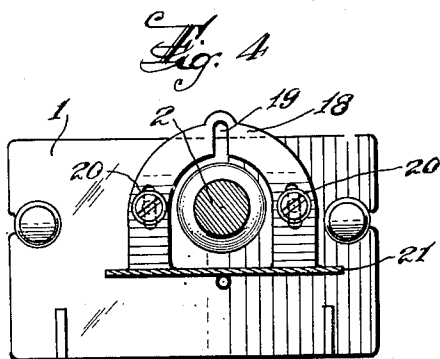
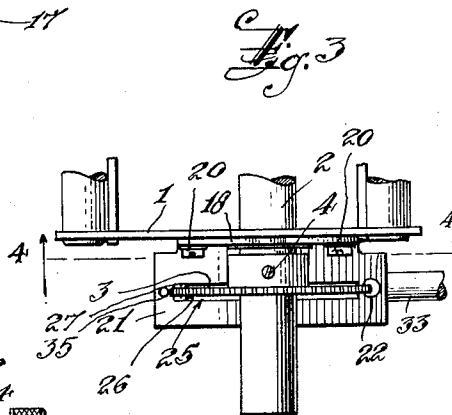
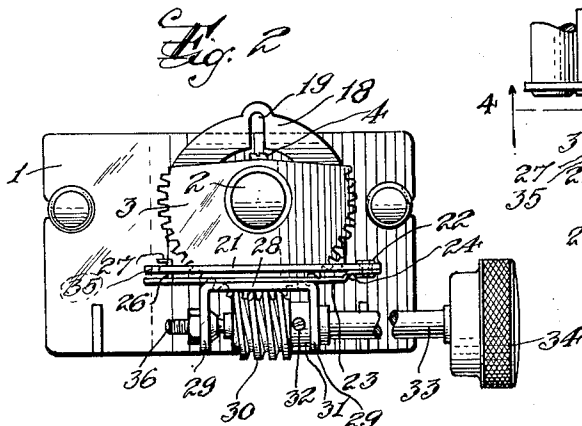
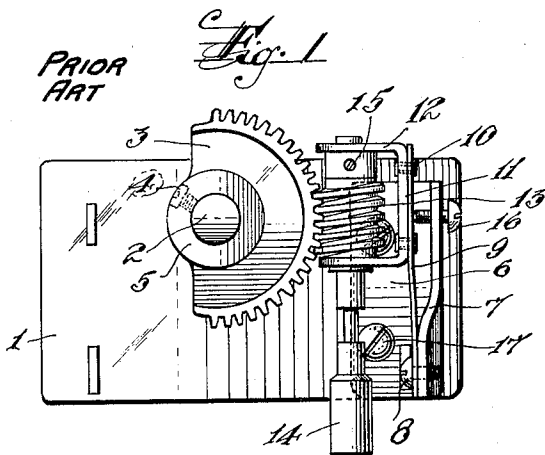
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GEARING MEANS

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GEARING MEANS

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13 Claims. (Cl. 74—10)

This invention relates to a gearing attachment particularly useful for the operation of a rotatable shaft where it is desired to get a slow, smooth movement as in the adjustment of the rotor of a radio tuning device. For the purpose of illustration, I have chosen to show my invention in connection with a variable tuning condenser such as used in the tunable circuit of a radio receiving set.

It is one of the objects of the invention to obtain a gearing attachment which, as has been stated, will give a slow and smooth rotary movement to a shaft that is to be turned.

A further object of my invention is to provide a gearing attachment which may be fastened to a support plate or member, which assists in supporting the shaft to be turned, in various arcuate positions around the shaft, whereby the operating means or the attachment can be reached from a desired direction, thereby facilitating mounting the apparatus having the shaft to be turned in any desired position.

Another object of my invention is to provide a gearing attachment for the purposes previously described which is relatively simple and compact and inexpensive to manufacture.

I have chosen to illustrate my invention as applied to a tuning condenser used in radio receiving sets, and in order that the improvements may be more fully understood and appreciated, I have thought it advisable to illustrate in

Figure 1 a prior art structure which shows a gearing attachment applied to the end plate of a tuning condenser.

Figure 2 is a view similar to Figure 1, but showing my improved gearing attachment.

Figure 3 is a plan view looking down on the top of Figure 2.

Figure 4 is a section on the line 4—4 of Figure 3.

Figure 5 is a side view of Figure 2, looking from left to right.

Referring to Figure 1, 1 is an end support plate or member of the frame of a tuning condenser having a rotor shaft 2 with a gear 3 adapted to be attached thereto as by means of a set screw 4 positioned in the hub 5 of the gear 3.

Fastened to the plate 1, in any satisfactory manner as by screws 17, is a bracket 6 having an offset shelf portion 7. Fastened to the shelf 7 in any satisfactory manner as by screws 8, is a relatively thin and flexible plate or arm 9, to the extremity of which is fastened, as by means of rivets 10, a saddle 11. The saddle 11 has a pair of legs 12 between which is rotatably posi-

tioned a worm 13 fastened to an operating shaft 14 as by a pin 15. Tension is applied to the member 9 by an adjusting screw 16 carried by the bracket portion 7.

From the above described construction, it will be seen that the worm 13, being carried by the saddle 11 on the extremity of the flexible arm 9, may be readily displaced from its true running position with the gear 3 by any side pressure on a knob (not shown) or other operating member fastened to the shaft 14. The member 9 will actually pivot about the end of the adjusting screw 16. Furthermore, for one direction of rotation of the worm, the reaction will be such as to flex the spring member 9 to draw the worm tightly into mesh with the gear 3, whereas for the other direction of rotation, there will be a tendency to throw the worm 13 away from the gear 3, thus giving a pronounced difference in the operation; that is, the "feel" on the operating knob attached to the shaft 14 will be materially different—and the user raises objections to these differences.

Coming now to my improved attachment, the parts 1, 2, 3, and 4 correspond to the similar parts in Figure 1. I have provided a yoke 18 provided with a plurality of elongated slots 19 therein, three being shown in Figure 4, so that the yoke 18 may be arcuately positioned on the support member or plate 1 in various or different positions, it being understood that the plate 1 has the necessary number of threaded holes properly disposed to receive the yoke-holding means in the form of screws 20.

The yoke has a shelf 21 bent at substantially right angles thereto and in a direction away from the support plate 1 and parallel to the shaft 2. At one end of the shelf 21, there is fastened by any satisfactory means, as rivet 22, an arm 23 having a slight offset 24 so that substantially a greater portion of the arm 23 extends below, generally parallel with the shelf 21, the shelf and arm being preferably of the same width. The shelf 21 is provided with an extended slot 25 through which a lug 26, punched upwardly from the arm 23, extends. The lug 26 is positioned in the arm 23 so the lug 26 is at the extremity of the slot 25 in the shelf 21 and has an end 27 bent over so as to engage the shelf 21 on a small movement of the arm 23.

To the arm 23, is fastened in any satisfactory manner, a saddle having a base portion 28 from which extend substantially parallel legs 29. Between the legs 29 there is mounted a worm 30 having a collar 31 to receive a set screw 32 for

fastening the gear to an operating means such as a small shaft 33 carrying an operating knob 34. Both the arm 23 and the base 28 of the saddle have slots in alignment with the slot 25 in the shelf 21 to receive the gear 3 adapted to mesh with the worm 30.

Both Figures 1 and 2 are full-size drawings of actual operating devices, but in Figure 2 the arm 23 is fairly rigid but is so attached to the shelf 21 that it can move slightly to take care of inequalities or rough places in the teeth of the gear or on the worm. Its inherent resilience is sufficient to keep the worm 30 closely in mesh with the gear 3, and any tendency to separate the worm gear is allowed through the small movement limited by the lug 27 or equivalent means. In other words, the mounting for the worm 30 is such that side pressure on the knob 34 will not produce the irregularities or roughness in operation between the worm and gear as in the structure of Figure 1. On the contrary, a very smooth and easy-operating attachment results from my improved construction shown and described.

In manufacturing the yoke 18 having the shelf 21, I prefer to put holes 35 at both ends of the shelf, whereby the arm 23 may be mounted reversely from that shown in Figure 2, thereby reversing the positions of the knob 34 and the worm bearing 36. When the arm 23 is mounted in reverse position, the lug 27 will be at the opposite end of the slot 25 in the shelf 21. By thus making the worm mounting per se reversible and the yoke 18 adjustable around the shaft 2, any desired and convenient arrangement of these parts can be secured.

What I claim is:

1. A gearing means for a mechanism having a support plate and an operating shaft supported at least in part by said plate, including a yoke adapted to be attached to said support plate and around said shaft, said yoke having a shelf portion, an arm fastened at one end to one end of the shelf and extending generally parallel with but in spaced relation to the shelf, a saddle having a base and spaced legs extending therefrom, the base being fastened to said arm, the shelf, arm and base of the saddle having slots in alignment, a gear adapted to be carried on said shaft and projecting through said slots, a worm operatively positioned between the legs of the saddle to engage said gear, and means for driving said worm.

2. A gearing means as set forth in claim 1, further defined in that the said arm has a free end having a lug extending beyond the surface of the shelf which is toward the shaft and has a part adapted to engage the shelf for the purpose described.

3. A gearing means as set forth in claim 1, further defined in that the said arm has a free end having a lug extending through an end of the slot in the shelf, and has its end bent over so as to engage the surface of the shelf which is toward the shaft for the purpose described.

4. A gearing attachment as set forth in claim 1, further defined in that said yoke is provided with means cooperative with the support plate whereby it may be mounted in various arcuate positions around the shaft.

5. A gearing means as set forth in claim 1, further defined in that said arm has a free end and is normally free from any tension except its own inherent tension, means independent of the gear and worm being provided for limiting the movement of the free end of the arm away from the shelf.

6. A gearing means as set forth in claim 1, further defined in that said arm has a free end and is normally free from any tension except its own inherent tension, means independent of the gear and worm being provided for limiting the movement of the free end of the arm away from the shelf, said shelf acting as a stop for the arm in a direction toward the shaft.

7. A gearing means for a mechanism having a support plate and an operating shaft supported at least in part by said plate, including a yoke having means cooperating with means associated with said support plate whereby the yoke may be adjustably arcuately positioned around the shaft in different positions, a slotted shelf carried by the yoke, a slotted arm fastened at one end to one end of the shelf and extending in spaced parallel relation to the shelf with its slot in alignment with the seat in the shelf, a slotted saddle fastened to said arm with its slot in alignment with the slots in the shelf and arm, a gear carried on said shaft and extending through all of said slots, legs extending from said saddle, a worm mounted between said legs and a shaft for turning said worm.

8. A gearing means as set forth in claim 7, further defined in that the shelf is a straight flat member integral with the yoke while the said arm is also straight and flat except for an offset at the end where it is attached to the shelf.

9. A gearing means for a mechanism having a support plate and an operating shaft supported at least in part by said plate, including a yoke adapted to be adjustably positioned about said shaft, said yoke having a shelf extending therefrom at substantially a right angle, a self-tensioning arm attached at one end to the shelf, a saddle fastened to said arm and having extending legs, the shelf arm and saddle being slotted to receive a gear carried by the shaft, a worm rotatably mounted between said legs and a shaft for operating said worm.

10. A gearing means for a mechanism having a support plate and an operating shaft supported at least in part by said plate, including a yoke adapted to be adjustably positioned about said shaft, said yoke having an integral slotted shelf formed at right angles to the yoke, a slotted arm of substantially the same width as the shelf fastened at one end to one end of the shelf so the slots are in alignment and having a free end, a saddle having a slotted base fastened to the arm so its slot is in alignment with said other two slots and legs extending from the base, a worm positioned between said legs, means for turning the worm, a gear-wheel carried by said shaft and extending through to all of said slots into mesh with said worm, and means for limiting the movement of the free end of the arm.

11. A gearing means as set forth in claim 9, further defined in that the saddle is attached to said arm substantially at its central portion.

12. A gearing means for a mechanism having a support plate and an operating shaft supported at least in part by said plate, including a yoke adapted to be attached to said support plate at various arcuate positions around the shaft, a gear-wheel adapted to be mounted on said shaft, a shelf carried by the yoke, a saddle resiliently attached to said shelf and a worm gear to mesh with said gear carried by said saddle.

13. A gearing means for a mechanism having a support plate and an operating shaft supported at least in part by said plate, including a yoke adapted to be adjustably positioned about said

shaft, said yoke having a shelf extending there-
from at substantially a right angle, said shelf
having holes at both ends, an arm adapted to be
attached at either end of the shelf through the
5 medium of said holes, a saddle fastened to said
arm and having extending legs, the shelf arm

and saddle being slotted to receive a gear car-
ried by the shaft, a worm rotatably mounted be-
tween said legs and a shaft for operating said
worm.

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