

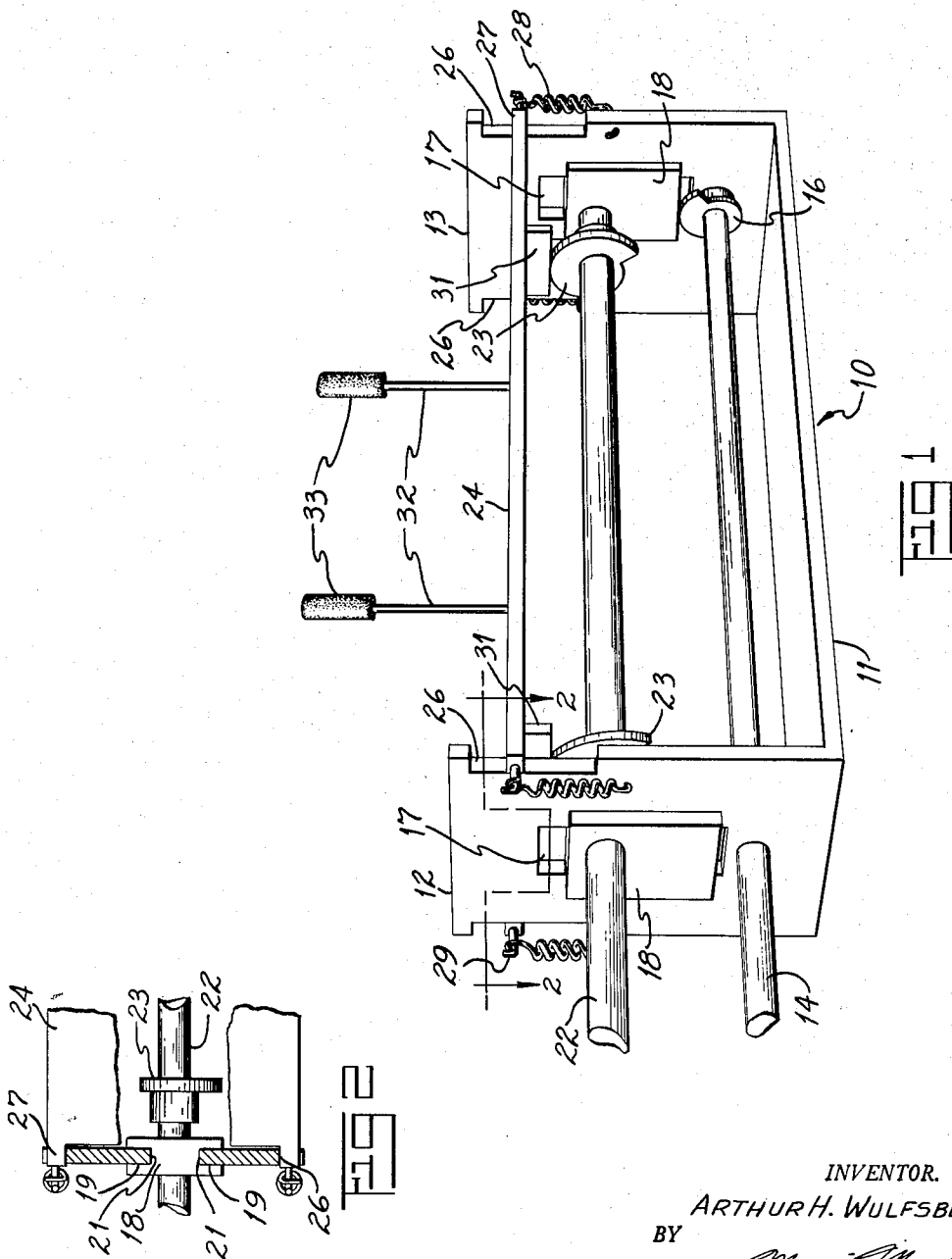
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DIFFERENTIAL TUNING MECHANISM

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DIFFERENTIAL TUNING MECHANISM

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1

This invention relates in general to tuning mechanisms, and in particular to a new and novel differential tuning device.

It is often desirable to make an adjustment which requires a coarse and a fine change. For example, if a change in position is to be a relatively large one it is impractical to use a fine adjustment control to move from one position to another, and thus a coarse adjustment is required to quickly move to the vicinity of the new position. The fine adjustment may then be used to find the exact position.

An object of this invention is to provide means for accomplishing differential tuning.

Another object of this invention is to provide a novel arrangement for tuning a longitudinally movable body.

Another object of this invention is to provide an inexpensive and easy to operate differential tuning mechanism.

A feature of this invention is found in the provision for a generally U-shaped bracket which carries a first shaft rotatably supported therein with camming means mounted thereon and with the camming means engageable with slidable bearings mounted within the frame member to move them up and down. A second shaft is rotatably supported in said slide bearings and carries second camming means engageable with a sliding plate. The sliding plate may thus be moved vertically by rotating both of the shafts. The second camming means generally covers the coarse adjustments and the fine adjustments are made by the first camming means.

Further objects, features and advantages of this invention will become apparent from the following description and claims when read in view of the drawings, in which;

Figure 1 is a perspective view of the differential tuner of this invention; and,

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figure 1 illustrates a bracket, designated generally as 10, which comprises the base 11 and the end portions 12 and 13, respectively. A shaft 14 is rotatably supported adjacent the lower ends of the legs 12 and 13 and carries thereon cams 16 at either end thereof. A rectangular opening 17 is formed in the ends 12 and 13 above the shaft 14. Slidable blocks 18 are slidably mounted in the slots 17 as shown in Figure 2. The blocks 18 are formed with the recesses 19 for receiving the edges 21 of the end walls. A second shaft 22 is rotatably supported in the block 18 and second camming means 23 are mounted thereon

2

between the ends 12 and 13. A plate 24 extends between the end walls 12 and 13 and rides in guides 26 formed in the end walls 12 and 13. A plate 24 has extending portions 27 at either end thereof to be received in the recesses 26. Springs 28 are attached to the ends 27 of the plate 24 by holding means as, for example, the pins 29, and the opposite end of the springs 28 are connected to the end walls 12 and 13.

Thus the plate 24 is always urged downwardly with reference to Figure 1. Downwardly extending portions 31 are attached to the under side of the plate 24 and are engaged by the cams 23. A plurality of rods 32 extend from the plate 24 and terminate in slugs 33 which may be, for example, tuning slugs for variable inductors. As is well known to those skilled in the art, the inductance of a coil of wire may be varied by adjusting the longitudinal position of a magnetic core relative to the coil.

In operation the shaft 22 may be rotated manually, or by suitable driving means, not shown, and the plate 24 will move up and down in response to the rotation. The cam 23 may have a varying radius and coarse adjustments of the longitudinal position of the slugs 33 may be made by rotating the shaft 22. Rotation of the shaft 14 causes the blocks 18 to move up and down in the opening 17. The cam 16 may have a relatively small change in radius and can be used to make fine adjustments.

As the shaft 14 is turned the cam 16 imparts motion to the blocks 18, which in turn move the cams 23 and the plate 24. The springs 28 bias the plate 24 downwardly with reference to Figure 1 and thus as the cams 23 and 16 are turned in a direction to decrease the radius, the springs will maintain the cammed portions in contact with the cams.

One embodiment of the apparatus built by applicant has a cam 16 with a radius change of $\frac{1}{16}$ the radius change of cam 23. Thus if the shaft 22 is movable to ten equally spaced positions, the shaft 14 may be used to locate any point between the steps of the cam 23.

It is to be understood, of course, that any number of slugs 33 may be mounted on the plate 24.

Although this invention has been described with respect to a particular embodiment it is not to be so limited as changes and modifications may be made which are within the full intended scope of this invention, as defined by the following claims.

I claim:

1. Means for differentially moving a body com-

prising a generally U-shaped frame, a first shaft rotatably supported between the legs of said frame, a block slidably supported in each end of said frame, a second shaft rotatably supported in said blocks, a pair of cams on said first shaft engageable with said blocks, a plate slidably mounted on the ends of said frame member, a second pair of cams mounted on the second shaft and engageable with said plate, and flexible means connected to said plate and said frame member, to urge the plate toward said second cams.

2. Mechanism for differentially moving a body comprising, a base member, an upright supporting member at either end of said base member, a plate slidably supported between said support members, a block slidably mounted in a slot formed in each of the support members, a first shaft rotatably supported in said blocks, first camming means mounted on said first shaft and engageable with said plate, a second shaft mounted adjacent the lower end of said supports and second camming means carried on said shaft and engageable with said blocks to move them in response to rotation of said second shaft.

3. A system according to claim 1 wherein a plurality of inductive slugs are mounted on said plate to move them therewith.

4. Means for varying the position of a plate comprising, a pair of upright supports formed with guides for receiving said plate, a slot formed in each of said upright supports, a block slidably mounted in the slots formed in said upright sup-

ports, a first shaft rotatably supported in said blocks, first camming means carried on said shaft and engageable with said plate, spring biasing means connected between said plate and said upright supports to urge said plate into engagement with said first camming means, a second shaft rotatably supported in said upright supports, and second camming means carried on said second shaft and engageable with said slidable blocks.

5. Means for varying the inductance of a slug-tuned coil comprising, an upright supporting means, a first shaft rotatably supported in said supporting means, first camming means carried on said first shaft, a block slidably mounted adjacent said first shaft for slidable motion on said supporting means, a second shaft rotatably supported in said block, second camming means carried on said second shaft, slug engaging means slidably mounted on said upright support and engageable by second camming means, and flexible means connected to said slug engaging means and said upright supporting means.

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