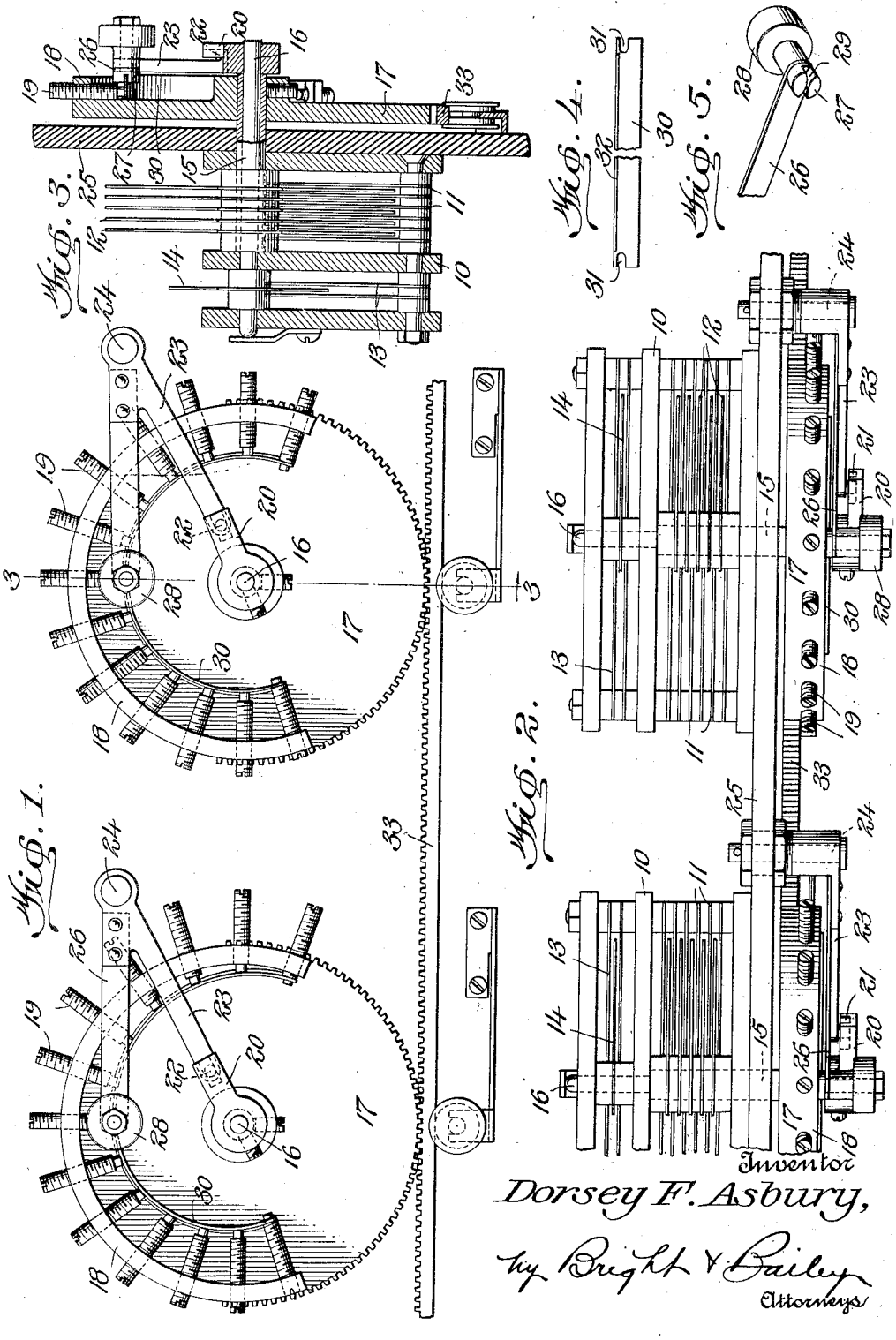
March 28, 1933. D. F. ASBURY 1,903,156

RADIO APPARATUS

Filed March 16, 1926



Inventor
Dorsey F. Asbury,
by Bright & Bailey
Attorneys

Patented Mar. 28, 1933 1,903,156

UNITED STATES PATENT OFFICE

DORSEY F. ASBURY, OF BROOMES ISLAND, MARYLAND

RADIO APPARATUS

Application filed March 16, 1926. Serial No. 95,138.

My invention relates to radio apparatus, and has particular reference to improvements in operating means for the turning units of receiving sets, whereby a plurality of tuning units, when connected together by a common operator for collective operation, and when operated collectively, may be caused to tune simultaneously and accurately with different wave lengths, without the necessity of individually adjusting the units.

More particularly it is my present purpose to provide a vernier tuning unit with means for moving the vernier portion thereof variably with respect to movement of the main portion thereof whereby the unit may be caused to tune with different equally spaced wave lengths either by equal or unequal amounts of movement of the main portion thereof as desired, and whereby a plurality of such tuning units, when connected together for collective operation, and when operated collectively, may, as aforesaid, be caused to tune simultaneously and accurately with different wave lengths either by equal or unequal amounts of movement of the main portion of different units with respect to one another.

My improvements contemplates the provision of a cam for transmitting movement of the main portion of a vernier tuning unit to the vernier portion thereof, and it is my purpose to provide means for adjusting said cam so that a given amount of movement of the main portion of a tuning unit may be caused to produce not only different, but variable amounts of movements of the vernier portion of the unit; also it is my purpose to provide means whereby the correctness of the adjustment of the cam of any unit to accomplish the purposes mentioned either in respect to a single unit or a plurality of units connected for collective operation may readily and easily be determined, all in a simple, cheap arrangement that is thoroughly reliable and efficient in operation.

My inventive idea is capable of embodiment in different mechanical structures, one of which is shown in the accompanying drawing, but it is to be understood that the structure shown is merely intended as a disclosure of the essential features and novel characteristics of my invention in a preferred form and that its scope is as defined in the appended claims.

In the drawing, wherein like characters of reference denote corresponding parts in the different views:—

Figure 1 is an elevation showing an adaptation of my invention to each of a plurality of tuning units connected together for collective operation;

Fig. 2, a plan view of the structural arrangement shown in Fig. 1;

Fig. 3, a transverse section on the line 3—3 of Fig. 1;

Fig. 4, a detail view of a portion of one of the cams; and

Fig. 5, a fragmentary perspective showing the construction of the cam follower and a portion of the yieldable means for holding same in engagement with the cam.

As the means constituting my present invention is intended primarily for causing the vernier portion of a tuning unit to be moved at different variable velocities during movement of the main portion of the tuning unit at a constant velocity, and as said means is not restricted in its adaptation to any particular style, type or construction of tuning unit, the present disclosure, in which the tuning units are illustrated as vernier condensers, should not be construed as a limitation of the range of usefulness of my improvements in this respect.

A vernier condenser of a type particularly adapted for operation by my improved means consists, as shown in Figures 2 and 3 of the drawing, of a frame 10, a main set of stator plates 11, a main set of movable plates 12 and stator and movable auxiliary or vernier plates 13 and 14, respectively. The main set of movable plates 11 are mounted on a hollow shaft 15, while the movable vernier plate or plates, as the case may be, is or are mounted on a shaft 16 which passes through shaft 15 and is rotatable therein, my invention consisting in providing means whereby movement of the plates 12 at a constant velocity may be caused to produce movement of the

vernier plate or plates 14 at different variable velocities or in different directions whereby a straight line or any other line frequency may be obtained without particular regard to the shape of either the main or vernier plates and whereby a plurality of condensers, when connected together for collective operation, and when operated collectively, may be caused to tune simultaneously and accurately with different wave lengths.

In adapting my improvements to a condenser of the type shown I secure to hollow shaft 15 a peripherally toothed disk or wheel 17 and through a laterally extending marginal flange 18 on said disk or wheel I thread a plurality of screws 19, said screws preferably being evenly spaced circumferentially of said flange and being disposed radially with respect to shaft 15 as shown. On shaft 16 I secure a short lever arm 20 having a slot 21 therein which receives a pin 22 at the free end of a lever arm 23, which lever arm is pivoted as at 24 to some fixed support, such for example, as a panel board 25 upon which condenser 10 is mounted. To lever arm 23 I secure one end of a spring blade 26 which blade extends across a portion of the flanged face of disk or wheel 17 and carries at its free end a cam follower 27 and a hand grip knob 28. Cam follower 27 is slotted as at 29 to receive an edge portion of a cam member 30 which is adjustably mounted on disk or wheel 17 by means of the aforementioned screws 19, the result being that when said disk or wheel is rotated to rotate the main condenser plates 12, cam 30 is rotated and as a consequence arm 20 is swung because of its connection through arms 23, 26 with said cam to rotate the movable vernier blade or blades variably with respect to the main blades according to the shape of said cam.

Cam 30 is formed from a thin strip of inherently resilient material having a slot 31 at each end thereof to receive reduced portions at the inner ends of the two terminal screws 19 so that when it is flexed and sprung into engagement with the screws 19 it is maintained under a bending movement in engagement with said screws, and since its tendency, due to its flexure, always is to spring outward it is merely necessary that the screws 19 contact with the outer face thereof without necessarily having positive connection therewith in order that it may be adjusted to and maintained in any shape desired, it being obvious that by adjusting the screws 19 different portions of the cam strip may be adjusted with respect to one another to cause any desired amount of movement of the vernier plate or plates 14 to be produced during any predetermined amount of movement of the main plates 12.

A small flange 32 is formed along one edge of cam strip 30 for engagement by the inner ends of the screws 19 to prevent said cam strip from springing outward with respect to disk or wheel 17, the said flanged edge of said strip contacting with the outer face of said disk or wheel whereby it is held against lateral movement in an opposite direction.

Any desired plurality of tuning units as just described may be connected together for collective operation in any preferred manner, a rack 33 being shown in the present instance cooperating with the peripheral teeth of the disks or wheels 17 of a plurality of condensers for accomplishing this purpose, and thus it is apparent that by properly adjusting the cam strips 30 of each unit the vernier plates of the respective units may be caused to be moved the exact amount required during collective operation of the main plates of the units by rack 33 to cause all units to tune simultaneously and accurately with any wave length encountered by any unit during collective operation of the units.

Spring blade 26 provides means whereby the cam follower 27 of any unit may at any time be disengaged from its related cam strip 30 to permit movement of the vernier portion of any unit independently of the main tuning portion of the units so as to indicate in which direction it is necessary to adjust cam strip 30 as well as the amount of adjustment necessary to be imparted thereto, and whereby the accuracy of the adjustment of any particular cam to accomplish the purposes mentioned may readily and easily be determined it being necessary merely to pull knob 28 to flex spring arm 26 outward to disengage cam follower 27 from cam 30.

Obviously the vernier portion of a vernier tuning unit need not be mounted on a shaft that extends through a hollow shaft carrying the main movable portion of the unit in order that said main and vernier portions may be operated variably by the means constituting my invention, since it is apparent that the vernier portion of the unit might as readily be mounted for example on the pivot pin 24 of arm 23 or to any other of the parts that is operated by cam 30.

From the foregoing description considered in connection with the accompanying drawing, it is believed that the construction, operation and advantages of my improvements will be fully understood. I desire to point out, however, that various changes and desirable additions may be made in and to the structural arrangement shown within the spirit and scope of my invention as defined in the appended claims.

I claim:

1. In mechanism of the class described consisting of a plurality of instrumentalities in cooperative relation and adapted to be adjusted from a single point of control, a main rotatable controlling element adapted to im-

part movement in equal degree to each of said instrumentalities, rotatable members comprised in each of said instrumentalities and connected with said main controlling element and adapted to be rotated in equal degree by movement imparted therefrom, complementary elements cooperating with said rotatable elements and connections therefor, said connections comprising in each instance an individually adjustable cam track and a member cooperating therewith and adapted to impart independent compensatory movements to the complementary elements in an amount variably determined by the configuration of the cam track, substantially as described.

2. In mechanism of the class described consisting of a plurality of instrumentalities in cooperative relation and adapted to be adjusted from a single point of control, a main rotatable controlling element adapted to impart movement in equal degree to each of said instrumentalities, rotatable members comprised in each of said instrumentalities and connected with said main controlling element and adapted to be rotated in equal degree by movement imparted therefrom, complementary elements cooperating with said rotatable elements and connections therefor, said connections comprising in each instance an individually adjustable cam track and a member cooperating therewith and adapted to impart independent compensatory movements to the complementary elements in an amount variably determined by the configuration of the cam track, said cams being rotated with the main rotatable controlling element, substantially as described.

In testimony whereof I hereunto affix my signature.

DORSEY F. ASBURY.