

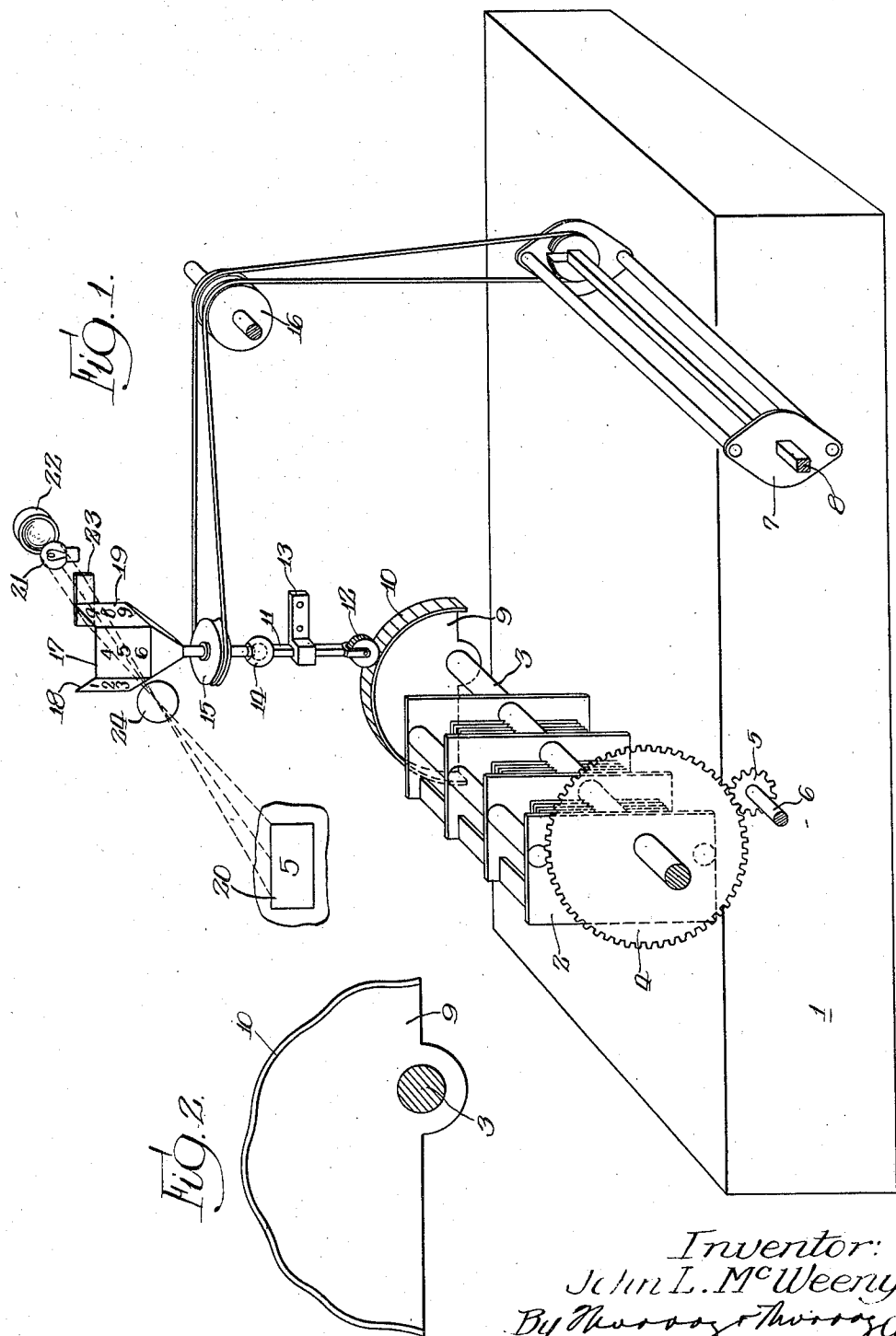
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INDICIA PROJECTION FOR RADIOS

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INDICIA PROJECTION FOR RADIOS

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4 Claims. (Cl. 116—124.1)

My invention relates to means for projecting the indicia commonly associated with a radio tuning dial, onto a screen, in enlarged, clearly definable, and accurate form.

5 An object of my invention is to simplify the problem of projecting the tuning indicia of multi-band radio receiving apparatus, by the use of a fixed light, lens and screen. In the specific form herein disclosed, I provide for bodily movement of the indicia-containing element in coordination with the tuning mechanism, but the form of said element is such that it presents advantages over a construction in which a disc or a cylinder is so moved. In the adaptation here disclosed I provide a series of plane strips which may or may not be joined at their edges, but which are angularly arranged and movable to bring successive strips into the line of projection of the light rays. These plane strips are particularly adapted for the application of the indicia in very small, closely spaced form by a simple printing process, thus greatly reducing the cost of the operation as compared to that of the forms heretofore disclosed. However, one of the most important advantages is that the indicia are disposed on a plane surface, thus avoiding the distortion that is inevitable where the indicia are disposed on a surface that is cylindrical or curved relative to the projecting lens.

Other objects and advantages will appear from the specific description of the apparatus.

My invention will be more readily understood by reference to the accompanying drawing, in which:

Fig. 1 is a perspective view somewhat diagrammatic in character and;

Fig. 2 is an enlarged detail of the operating cam.

By reference to the drawing, it will be seen that I illustrate a common form of radio chassis, 1, having superposed thereon a series of condensers, joined together, and mutually operable by the common condenser shaft, 3. Fixed to the forward end of the condenser shaft is the toothed gear 4, in mesh with a reduction gear 5, on the shaft 6, on which is the tuning knob, not shown.

Also formed in the chassis is the band switch 7, of conventional construction, having the shaft 8, to which is connected the band switch knob, not shown.

At the rear end of the condenser shaft 3, is connected a tuning cam 9, having a flat, bendable, bearing surface 10, formed to follow the capacity curve of the condenser.

The invention which I claim as novel in connection with the herein described mechanism

consists of the shaft 11, having at its lower end a wheel 12, adapted to rest upon the portion 10 of the tuning cam 9, said shaft 11, being slidably supported in the bracket 13, suitably fastened to the rear wall of the radio cabinet (not shown). Between the ends of the shaft 11, I provide a swivel joint 14, and a pulley wheel 15, secured to the shaft, and adapted to receive a cord, wire or rubber belt extending from a pulley on the band switch shaft 8 and over the guide pulley 16, to effect the rotation of the pulley 15 when the band switch is turned.

At the upper end of the shaft 11, I provide a plurality of flat, light-permeable, connected sheets 17, 18 and 19, each sheet being adapted to carry suitable tuning indicia for a predetermined band, and a screen of suitable size 20, having a ground glass face, is installed in the front wall of the radio cabinet, not shown. As shown, I have provided a light source 21, reflector 22, collecting lens 23, and magnifying lens 24, whereby the indicia printed upon any of the exposed sheets 17, 18, 19 may be projected in enlarged form upon the screen 20.

It will be noted that the light reflector, collecting lens and magnifying lens all remain in a fixed relation and that the indicia bearing element is movable. This is essential for the following reasons: The light emitting element can, for practical reasons, be of only small capacity, first because of the heat involved, and, second, because of the current cost. When a light of such reasonably small candle power is used the light must be concentrated if any reasonable illumination on the screen is to be expected. This is particularly true where the image is to be considerably enlarged as will be found necessary if the indicia carrying element is to be kept within practical size. With a large number of stations in service in the main broadcast band, their display on a single surface must be in very fine type. I have, therefore, found it impractical to provide merely general illumination behind the transparent or translucent indicia-bearing element.

The operation of my invention is as follows, assuming the operator wishes to tune a station upon the regular broadcast band; the tuning of the station is accomplished in the usual manner, by turning the tuning knob, connected through the gears 5 and 4, and shaft 3, to the cam 9. When the cam 9 rotates, it serves to raise or lower the shaft 11, thus raising or lowering the sheets 17, 18, 19. In the present instance, the sheet 17 is in projecting position, and the stations designed

nated thereon are projected on the screen 20 as desired. Likewise, if the operator desires either of the other two bands indicated, the sheets 18 and 19 are brought into operative position by the rotation of the knob on the band switch, which in turn causes rotative movement of the wheel 15 secured to the shaft 11.

A further and novel feature of my invention relates to means for correcting inconsistencies between the condenser and cam. It frequently happens that in securing a station, the station identification itself is not in register with the light concentration. This results from mechanical imperfection in the manufacture of the condenser, inasmuch as in commercial production it is extremely difficult to assure identical capacity in all the condensers. This situation is easily remedied by bending up or down, as desired, a portion of the bendable rim 10, of the cam 9, with pliers or some suitable tool, until the shaft and associated sheet are in proper position, relative to the condenser. This is illustrated in Fig. 2, the waved lines showing the bent portion. Obviously, this process may be carried on in the case of any number of inconsistencies on a single sheet, although obviously insofar as the rim 10 is bent, it will provide an inconsistency at that point when either of the other bands are put in operative position. It is my thought, however, that in this manner perfection may be attained in the one band that is most commonly used. The construction which is described is covered in a copending application, Serial No. 176,403, filed November 26, 1937.

The advantage derived from the use of a plurality of adjacent, flat, station-designating sheets is that in each instance, the stations or numbers projected upon the screen are absolutely uniform from end to end, and are not distorted at the edges as is the case with a cylindrical station-designating dial. In addition, the station designating sheets can be made quite small, due to the resulting enlargement of the indicia on the screen. Thus, this entire mechanism will be found to occupy a minimum of space within the cabinet.

Having thus described my invention, I shall proceed to claim the same as follows:

1. In radio receiving apparatus, the combination with tuning mechanism, of a plurality of flat sections of light-permeable material having station indicating indicia thereon, a light arranged to project rays perpendicularly through

a section means for concentrating the light rays on a limited area on said indicia bearing material, a lens for projecting and enlarging the indicia on said section onto a screen, means operable by the tuning mechanism for moving said flat sections to bring correlative indicia into the line of said light, and means for bringing successive sections into the path of said rays.

2. In radio receiving apparatus, the combination with tuning mechanism, of an indicia-receiving device, consisting of a series of flat sections of light-permeable material, a light, lens and screen, fixedly mounted means for concentrating the light rays on a limited area on said indicia bearing material, the light rays projecting in a line normal to the plane of a section of said device, means operable by the tuning mechanism for vertically moving said sections, and means operable to shift said device to bring successive sections into the range of said light.

3. In multi-banded radio receiving apparatus, the combination with tuning mechanism, of a plurality of adjacent, flat sections of light-permeable material having station indicating indicia thereon, a light arranged to project rays perpendicularly through a section means for concentrating the light rays on a limited area on said indicia bearing material, a lens for projecting and enlarging the indicia on said section onto a screen, means operable by and associated with the tuning mechanism for moving said flat sections to bring the indicia thereon into tuned relationship with the tuning mechanism, and means for bringing successive sections into the path of said rays.

4. In a multi-banded radio receiving apparatus, the combination with tuning mechanism and a band switch, of a plurality of adjacent flat sections of light-permeable material having station indicating indicia thereon, each section relating to a single wave band, a light arranged to project rays perpendicularly through a section means for concentrating the light rays on a limited area on said indicia bearing material, a lens for projecting and enlarging the indicia on said section onto a screen, means operable by and associated with, the tuning mechanism for moving said flat sections to bring the projected indicia thereon into tuned relationship with the tuning mechanism, and means associated with the band switch for bringing successive sections into the path of said rays.

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