

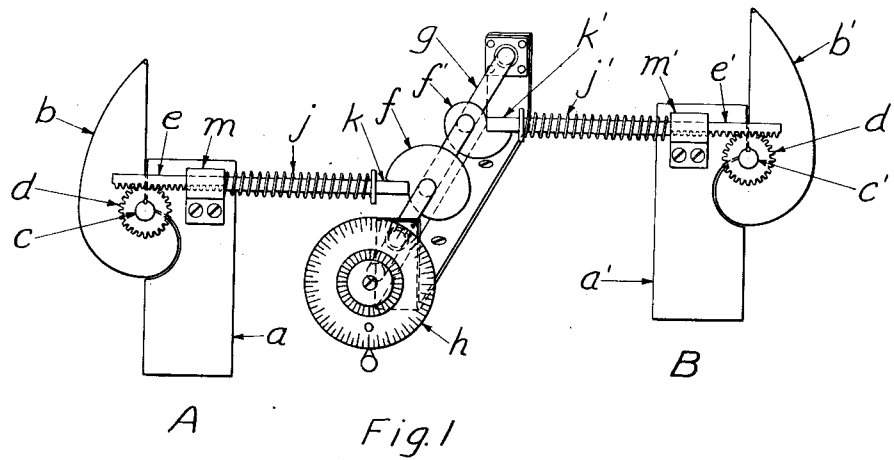
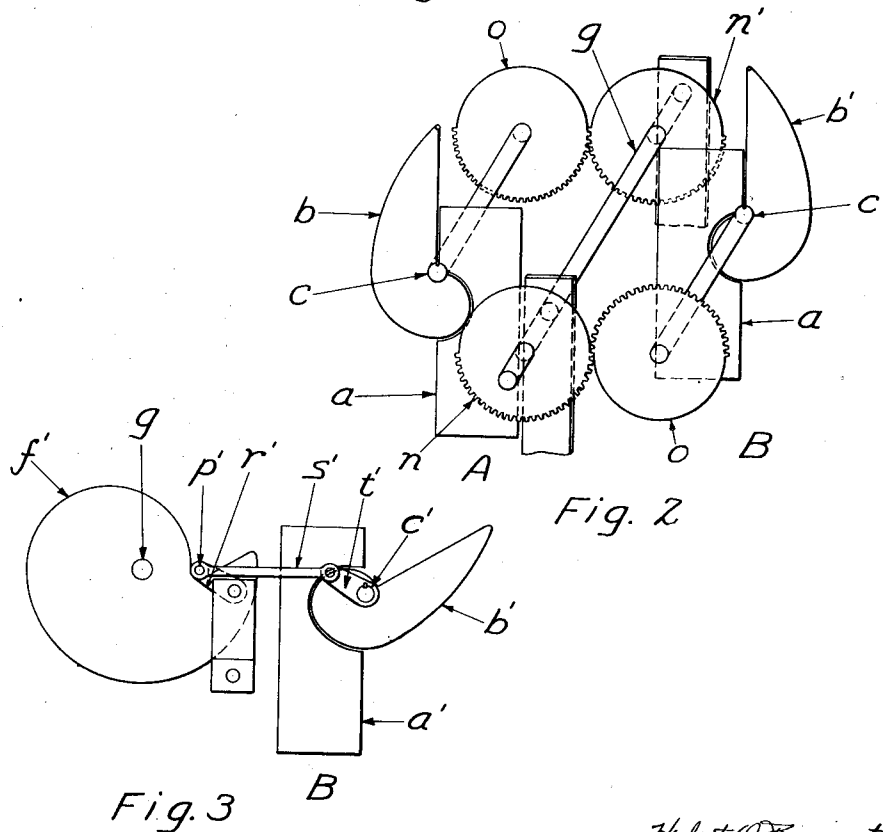
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MECHANISM FOR ADJUSTING CONDENSERS

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MECHANISM FOR ADJUSTING CONDENSERS.

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This invention relates to mechanism for adjusting the capacity of electrostatic condensers of the type having one or more plates which are movable relatively to other stationary plates. Variable condensers of this type have many uses, an important one being in connection with radio receiving and transmitting apparatus. In tuning a radio receiving apparatus, a fine adjustment of the capacity of such a condenser is often desirable. The customary type of variable condenser used in radio receiving sets is the so-called air condenser, wherein air is used as the dielectric. As the dielectric constant of air is comparatively low, it is necessary in order to obtain sufficient capacity for a condenser to use a considerable number of plates, these plates being customarily arranged so that the fixed and movable plates alternate, the movable plates being fixed to a common shaft which is turned by a manipulated knob. By my invention, I provide means whereby a plurality of movable plates are moved successively or in successive groups instead of simultaneously, so that each plate or group of plates moves through its entire range of motion before the next succeeding plate or group of plates is moved at all. Since the motion of a single plate produces relatively small change of capacity in the condenser, my mechanism thus provides for a slow increase or decrease of capacity, thus permitting a fine adjustment of the condenser. My improved mechanism is also arranged so that all of the plates are moved successively by the turning of a single knob.

For a more complete understanding of the invention, reference is had to the following description and to the drawing, of which,—

Figure 1 illustrates an embodiment of the invention partly in elevation and partly in perspective.

Figure 2 shows a modified form of the invention.

Figure 3 shows another modified form.

Referring to Figure 1 of the drawing in detail, two air condensers are indicated at A and B respectively. These may be separate condensers as shown, or may be arranged as portions of a multiplate condenser. These condensers comprise stationary plates a, a' and movable plates b, b' , the latter being mounted for rotation respectively on suitable shafts c, c' which carry respectively pinions d, d' . Instead of the single plates

b, b' as shown, the shafts c, c' may carry groups of plates. The pinions engage respectively the teeth of the racks e, e' , which are formed on the ends of rods or bars k, k' . It is obvious that longitudinal motion of the rods k, k' will result in corresponding motion of the movable plates b, b' , thus altering the electrostatic capacity of the respective condensers. Motion of the rods k, k' may be effected by suitable cams f, f' , which as shown are mounted on a common shaft g to the end of which is secured a knob suitable for manipulation by the operator, suitable springs j, j' being provided and arranged to keep the ends of the rods k, k' in contact with their respective cams. The cam f as shown is provided with a contour which for the first 180° is a spiral and for the next 180° is a semi-circle. Thus during the first half turn of the knob h the rod k and rack e are moved to their outermost position, and during the next half turn of the knob h they are maintained in such position. The cam f as shown has a contour of which the first 180° is a semi-circle, and the next 180° is a spiral. Thus the first half turn of the knob does not displace the rod k' , but during the second half turn of the knob the rod k' and rack e' are moved to their further limit of motion. Thus it will be seen that during a complete turn of the knob h the movable plate b is the first move from one extreme to the other of its range of motion, whereupon the plate b' is similarly moved. These motions are reversed when the knob is turned back again.

Other connecting mechanisms may be used instead of the rack and pinion. For example, a linkage such as that illustrated in Figure 3 may be used. This figure shows one of the cams (e. g. the cam f') and its operative connection with the plate b' . A similar connection may be used with the cam f and the plate b . As shown in Figure 3, a crank lever r' carries a pin p' which is held against the edge of the cam f' by a spring or other suitable means not shown. A crank arm t' is mounted on the shaft c' , the two crank arms being connected by a link s' . During the first half turn of the cam f' , the pin p' will be displaced toward the right, rocking both crank arms and swinging the plate b' . During the second half turn of the shaft g , the pin p and the plate b' remain steady.

Another modification of the invention is

illustrated in Figure 2. Instead of cams on the shaft *g*, I mount intermittent gears *n, n'*, each having half of its periphery smooth. These gears mesh with similar gears *o, o'*, the latter being mounted respectively on the shafts *a, a'* which carry the plates *b, b'*. As the shaft *g* is rotated in a clockwise direction, the gear *o* will be turned, then the gear *o'*.

10 It is obvious also that the principle of the invention can be applied to three or more plates or groups of plates as well as to the two illustrated in the drawing, since in such a case each cam or gear may be divided into as many sectors as there are plates, one sector of each cam having a spiral contour, the other sectors being circular. I do not confine myself to the use of cams such as are illustrated, but may employ other types of cams or levers or combinations of equivalent mechanical elements to obtain similar results.

Having thus described certain embodiments of this invention, it should be evident to those skilled in the art that various changes and modifications might be made therein without departing from its spirit or scope as defined by the appended claims.

I claim:—

1. An electrostatic condenser of variable capacity, comprising fixed plates and a plurality of movable plates, a rotatable shaft, 30 cams mounted on said shaft, there being a cam for each movable plate, cam followers for said cams, and means operatively connecting said plates with their respective cam followers, said cams being shaped to cause 35 said plates to move through their respective ranges of motion successively.

2. An electrostatic condenser, comprising fixed plates and a pair of plates movable about an axis, a gear associated with each plate and mounted to move coaxially therewith, a rack meshing with each said gear, a cam engaging each said rack, a rotatable shaft carrying said cams, and an operating knob mounted on an end of said shaft, one of said cams having a spiral contour over half its periphery followed by a semi-circular contour, other said cams having a semi-circular contour followed by a spiral contour. 50

In testimony whereof I have affixed my signature.

HERBERT O. FARRINGTON.