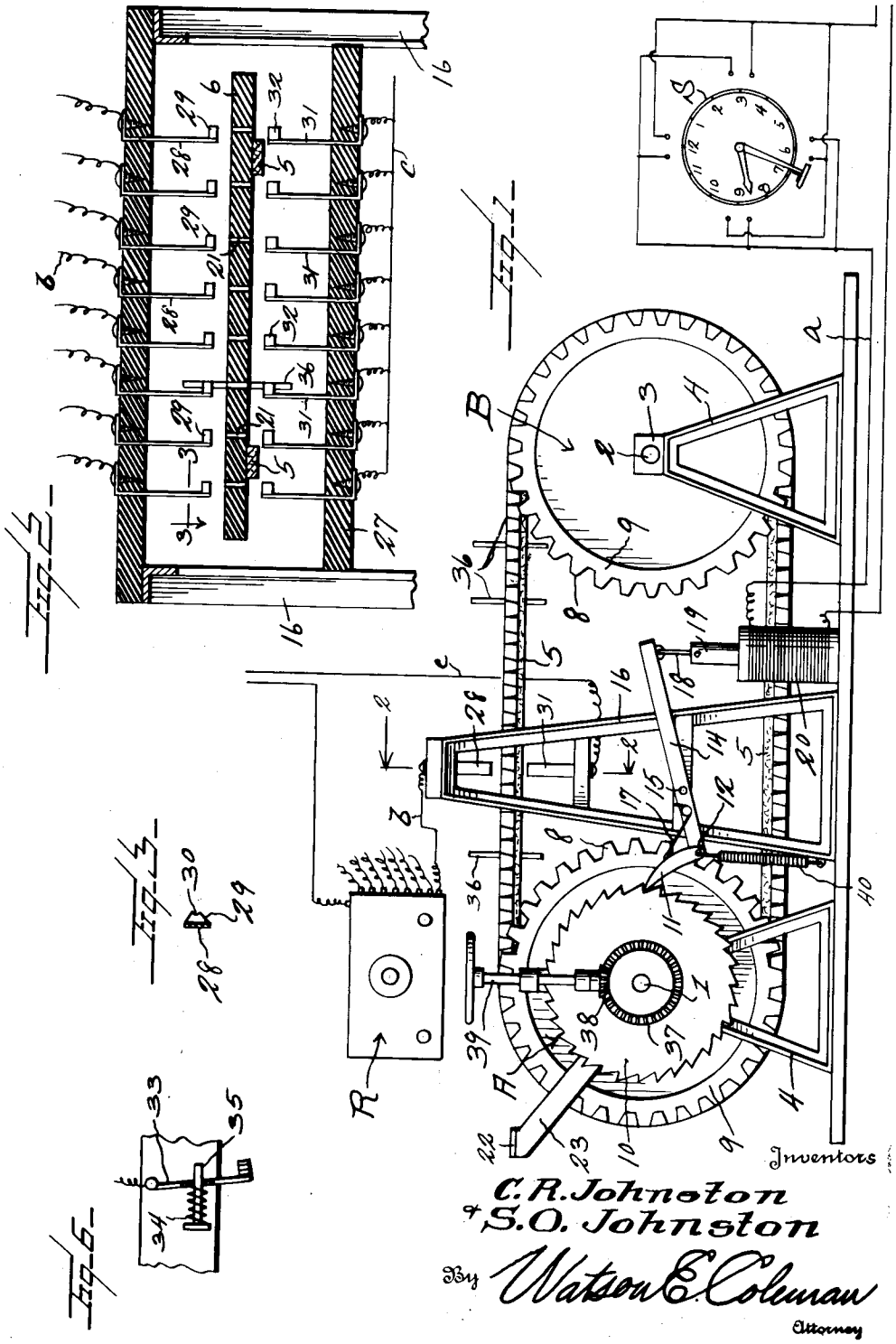
June 3, 1941. C. R. JOHNSTON ET AL 2,244,299

TIME CONTROLLED RADIO TUNING DEVICE

Filed Dec. 15, 1938 2 Sheets-Sheet 1



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Fig. 3

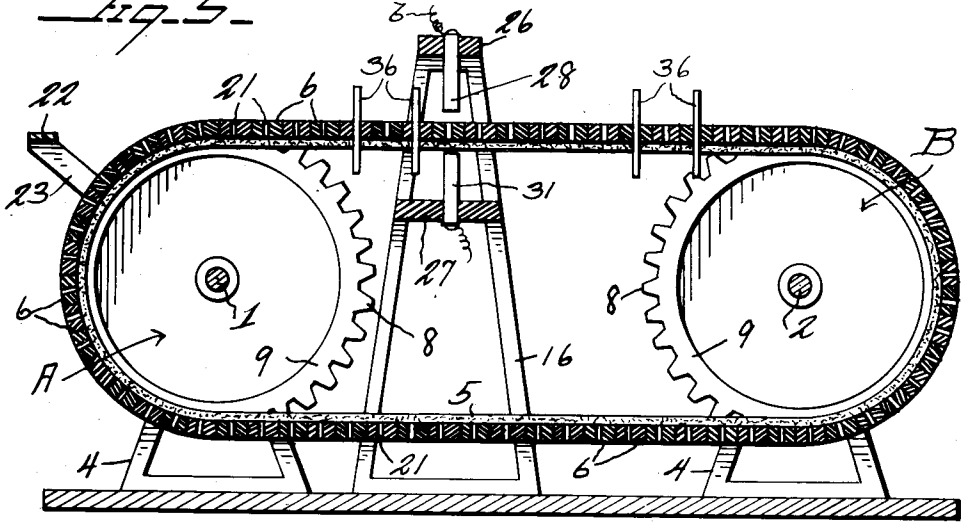
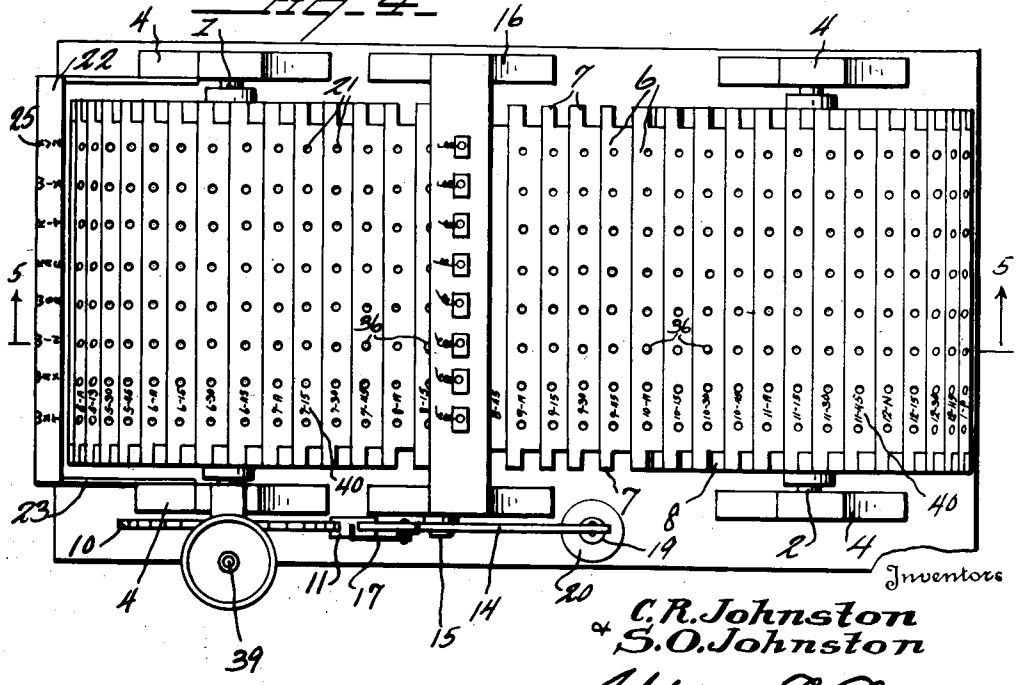


Fig. 4



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TIME CONTROLLED RADIO TUNING DEVICE

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5 Claims. (Cl. 200—37)

This invention relates to a time controlled radio tuning device, and it is primarily an object of the invention to provide a device of this kind for connection with a tuning unit of a radio receiver and wherein the device is so constructed and arranged to provide means for setting the radio receiver to receive over a period of hours certain previously selected programs consecutively.

Another object of the invention is to provide an apparatus of this kind for coaction with the tuning unit of a radio receiving set whereby the receiving set is automatically tuned as desired from one station to the other to allow the radio receiving set to consecutively receive programs from different broadcasting stations.

The invention consists in the details of construction and in the combination and arrangement of the several parts of our improved time controlled radio tuning device whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more comvenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of our invention will hereinafter be definitely claimed.

In order that our invention may be the better understood, we will now proceed to describe the same with reference to the accompanying drawings, wherein:

Figure 1 is a view in side elevation of an apparatus constructed in accordance with an embodiment of our invention and with certain of the parts associated therewith being diagrammatically illustrated;

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

Figure 3 is a detailed sectional view taken substantially on the line 3—3 of Figure 2;

Figure 4 is a view in top plan of the apparatus as illustrated in Figure 1;

Figure 5 is a sectional view taken substantially on the line 5—5 of Figure 4;

Figure 6 is a fragmentary elevational view illustrating a contact member constructed in accordance with another embodiment of our invention.

As disclosed in the accompanying drawings, A and B denote two rollers of desired dimensions mounted respectively for rotation with the shafts 1 and 2. These shafts 1 and 2, as herein disclosed, are rotatably engaged with conventional bearings 3 mounted upon suitably positioned supporting columns 4. The shafts 1 and 2 are in parallelism and the rollers A and B have disposed therearound endless belts 5 of desired material to the outer faces of which are suitably affixed the transverse bars 6. These bars 6 are of equal width. Each of said bars at its ends is provided with the outstanding lugs or teeth 7. These teeth 7 are of a width less than the width of the bar 6 and are positioned at one side thereof.

The spaces between the teeth or lugs 7 of adjacent bars 6 receive the teeth 8 of the gear elements 9 carried by the opposite end portions of the rollers A and B whereby the rollers A and B and the endless members or belts 5 are assembled for unitary movement.

The roller A is the driving roller and the shaft 1 of the roller A has fixed for rotation therewith a ratchet wheel 10. Coacting with this ratchet wheel 10 is an upstanding pawl 11 pivotally connected, as at 12, with an end portion of a rock lever 14. This rock lever 14 is supported for rocking movement at a predetermined point intermediate its ends, as at 15, with an adjacent upstanding tower 16 positioned to one side of the member or belt 5. There are two of these towers 16 located between the rollers A and B and between which the members or belts 5 pass. The pawl 11 is yieldingly urged and maintained in contact with the ratchet wheel 10 by a leaf spring 17 carried by the adjacent portion of the lever 14 and bearing against the pawl 11.

The end portion of the lever 14 remote from the roller A is operatively connected, as at 18, with the core 19 associated with the solenoid 20. As herein disclosed, the core 19 is normally maintained raised or extended under the action of a retractile spring 40 suitably secured to the forward or working end portion of the lever 14 and to the adjacent tower 16 at a point below the lever 14.

When the solenoid 20 is energized the core 19 will be retracted and the lever 14 swung a distance sufficient to cause the pawl 11 through the instrumentalities of the ratchet wheel 10 and shaft 1 to give the roller A rotation sufficient to advance the upper stretch of the member or belt 5 a distance equal to the width of a member 6. One of the conductors *a* of the electric circuit for the solenoid 20 has interposed therein a time controlled switch S of any preferred type and which switch is preferably of a character to close the circuit for the solenoid 20 every fifteen minutes although, of course, this may be varied as desired.

The members 6 are of a material non-conduc-

tive of electricity and disposed through each of the members 6 at spaced points therealong are the openings 21. The endless members or belts 5 are relatively narrow, as is illustrated in Figure 2, and the connections between said members or belts 5 and the members 6 are at such locations to prevent the members or belts 5 obstructing any of the openings 21. The openings 21 of the various members 6 are aligned in the direction of travel of said members to provide what may be termed longitudinal rows of openings. Each of such longitudinal rows of openings 21 is identified with a single broadcasting station. As the members 6 pass upwardly and forwardly over the driving roller A they also pass a transversely disposed bar 22 herein disclosed as supported in desired position by the arms 23 secured to the adjacent supports 4. This bar 22 adjacent to each longitudinal row of openings 21 is provided with a station identifying symbol 24, the purpose of which is obvious.

The towers 16 hereinbefore referred to terminate above the upper stretch of the members 6. These towers above such upper stretch are connected by the transverse member 26 and below said upper stretch are further connected by the transversely disposed member 27. These members are of a material non-conductive of electricity.

Depending from the top member 26 is a series of resilient contact members 28, there being one of such members 28 for each longitudinal series of openings 21. The contact member 28 for each series of openings 21 is positioned to one side of such series of openings and is provided at its lower end with a laterally directed lug 29 which normally extends over said row of openings. The side edges of this lug 28 converge outwardly as particularly illustrated in Figure 3 while the outer margin of said lug 29 is provided with a circular recess 30. Each of these contact members 28 is in proper electrical connection through a conductor *b* with the tuning unit for the radio receiving set R so that when a circuit is closed through a contact member 28 the radio receiving set will be automatically tuned to the station with which said contact member 28 is associated. As the tuning unit of the radio set forms no part of the present invention but is of a character now generally in use a detailed description and illustration thereof is not deemed necessary.

The lower cross member 27 is provided with a series of upstanding resilient and yielding contact members 31, there being one of such members 31 for each longitudinal series of openings 21. Each of these contact members 31 is positioned to one side of its associated row of openings 21 and at its upper end is provided with the laterally disposed lug 32 of a character similar to the lug 29 hereinbefore referred to. The contact members 31 are connected in series as illustrated in Figure 2 with the conductor *c* at one side of the circuit for the tuning unit.

In Figure 6 of the drawings is illustrated a form of the invention wherein a contact member comprises a swinging arm 33 constantly urged in a direction toward its row of openings by an expansible member 34, herein disclosed as a coil spring, surrounding a guide finger 35 freely disposed through the central portion of the arm 33. A contact member such as illustrated in Figure 6 may be employed either above or below the upper stretch of the members 6 in lieu of the contact members 28 and 31.

Elongated plugs 36 conductive of electricity are selectively inserted through the openings 21 of the various bars or members 6 in accordance with the programs desired. These plugs 36 are of such length that when applied they will have desired engagement with the required contacts 28 and 31 to close the proper circuit for tuning the receiving set R to the station desired. This contact is maintained in the present embodiment of the invention for a period of fifteen minutes and during the periods between the energizing of the solenoid 20 shifting of the members or bars 6 is prevented by having the contact members engaged within the recesses 30. While this is not at all times necessary the recesses 30 are provided as a precautionary measure.

The shaft 1 for the roller A also carries for rotation therewith a beveled gear 37 with which meshes a pinion 38 carried by a hand operated shaft 39. This shaft 39, as herein disclosed, is operatively supported by the adjacent support 4. The shaft 39 provides means whereby a manual adjustment of the members or bars 6 with respect to the contact members 28 and 31 may be readily and conveniently effected when desired.

Each of the members or bars 6 also carries a time indication 40 so that a member or bar 6 may be properly set with respect to the time of the program and also to further facilitate the desired selective placement of the plugs 36.

From the foregoing description it is thought to be obvious that a time controlled radio tuning device constructed in accordance with our invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that our invention is susceptible of some change and modification without departing from the principles and spirit thereof and for this reason we do not wish to be understood as limiting ourselves to the precise arrangement and formation of the several parts herein shown in carrying out our invention in practice except as hereinafter claimed.

We claim:

1. In combination with a plurality of electric circuits each having spaced contacts interposed therein, a plurality of bars arranged side by side and in close proximity, said bars being of the same width, means for connecting the bars for travel in a continuous path in a direction transversely of the bars, a stretch of the assembly of the bars travelling between the contact members of each of the circuits, means for intermittently moving said bars a distance equal to the width of a bar, and means carried by the bars and extending beyond opposite faces thereof to connect the spaced contacts in the circuits in desired sequence for selectively and consecutively closing the normally open circuits.

2. In combination with a plurality of electric circuits each having spaced contacts interposed therein, a plurality of bars arranged side by side and in close proximity, said bars being of the same width, means for connecting the bars for travel in a continuous path in a direction transversely of the bars, a stretch of the assembly of the bars travelling between the contact members of each of the circuits, means for intermittently moving said bars a distance equal to the width of a bar, contacts carried by and extending beyond opposite faces of the bars to connect the spaced contacts in the circuits in de-

sired sequence for selectively and consecutively closing the normally open circuits, and means positioned adjacent to the path of travel of the bars for locating the various contacts at points along each bar for determining the placement of said means.

3. In combination with a plurality of electric circuits each having spaced contacts interposed therein, a plurality of bars arranged side by side and in close proximity, said bars being of the same width, means for connecting the bars for travel in a direction transversely of the bars, said connected bars travelling between the contact members in each of the circuits, rollers supporting said endless assembly of bars, gear wheels rotating with said rollers, outstanding lugs at the ends of said bars engaging with the gear wheels, means for intermittently rotating one of the rollers for moving the bars a distance equal to the width of a bar, and means carried by the bars in desired sequence and extending beyond opposite faces of the bars for selectively and consecutively closing the normally open circuits.

4. In combination with a plurality of electric circuits each having spaced contacts interposed therein, a plurality of bars arranged side by side and in close proximity, said bars being of the same width, means for connecting the bars for travel in a direction transversely of the bars, rollers supporting said endless assembly of bars for movement between the contact members in each of the circuits, gear wheels rotating with said rollers, said rollers and bars being in driving connection, a ratchet wheel rotating with one of the rollers, a rock lever, a pawl carried by said lever engaging the ratchet wheel for rotating said ratchet wheel and associated roller upon rocking of the lever to move the bars a distance equal to the width of a bar, means for intermittently rocking the lever, and means carried by the bars in desired sequence and extending beyond opposite faces of the bars for selectively and consecutively closing the normally open circuits.

5. In combination with a plurality of electric circuits each having spaced contacts interposed therein, a plurality of bars arranged side by side and in close proximity, said bars being of the same width, means for connecting the bars for travel in a direction transversely of the bars, rollers supporting said endless assembly of bars, gear wheels rotating with said rollers, said rollers and bars being in driving connection, a ratchet wheel rotating with one of the rollers, a rock lever, a pawl carried by said lever engaging the ratchet wheel for rotating said ratchet wheel and associated roller upon rocking of the lever to move the bars a distance equal to the width of a bar, means for intermittently rocking the lever, contact members in the circuits positioned above and below a stretch of the endless assembly of the bars, each of said bars having longitudinally spaced openings, said openings being aligned in series extending lengthwise of the stretches of the assembly, each series of such openings being associated with the contact members of one circuit, and plugs conductive of electricity selectively insertible through the openings of the bars to engage the contact members to close the circuits in which said contact members are interposed.

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