

May 19, 1931.

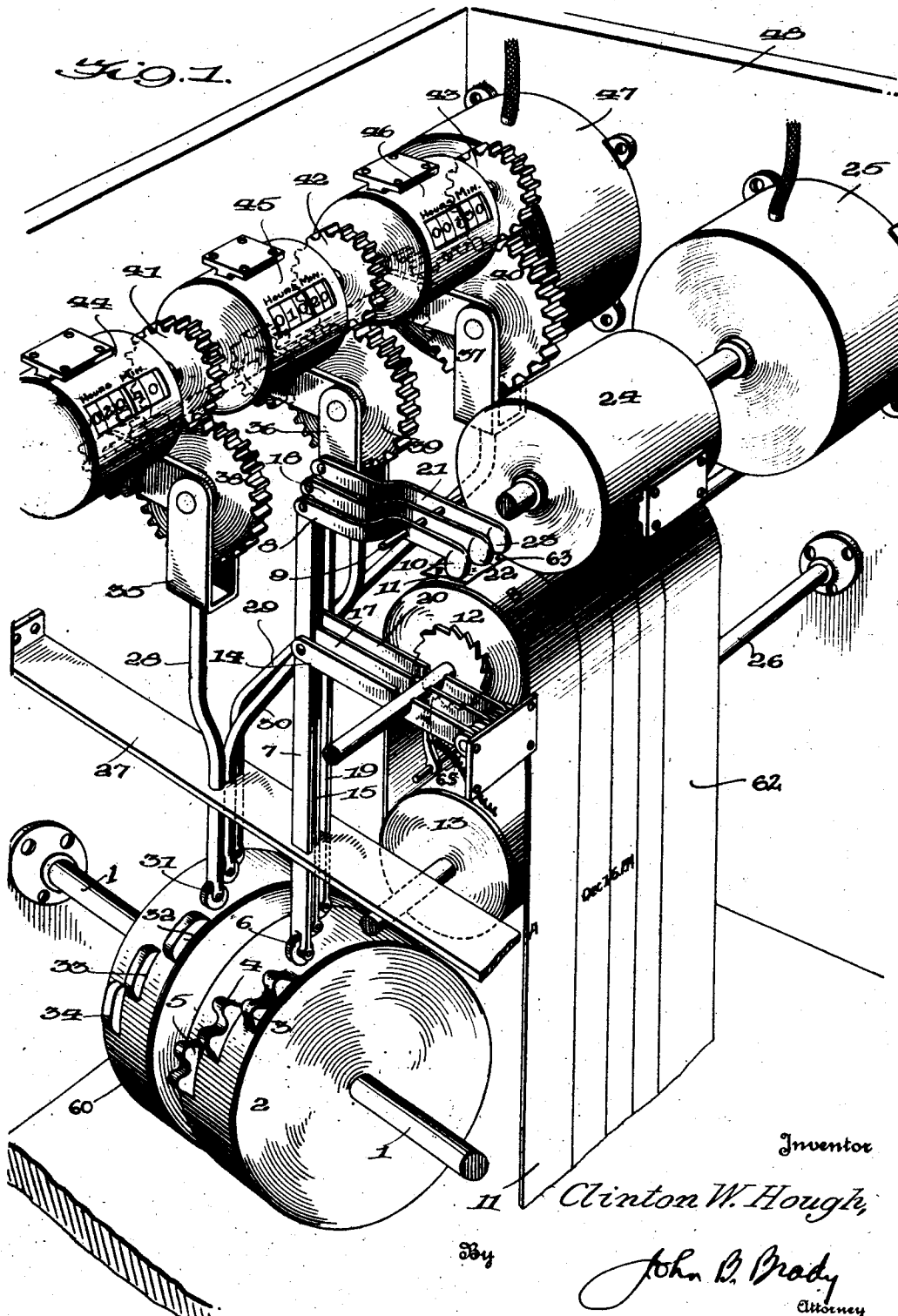
C. W. HOUGH

1,805,665

WIRED RADIO PROGRAM APPARATUS

Filed April 27, 1927

3 Sheets-Sheet 1



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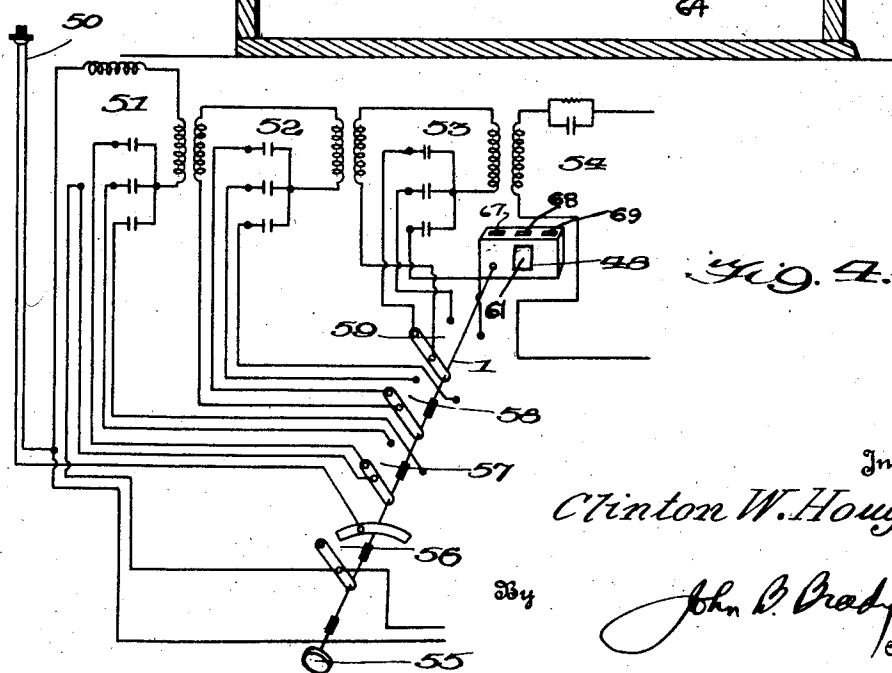
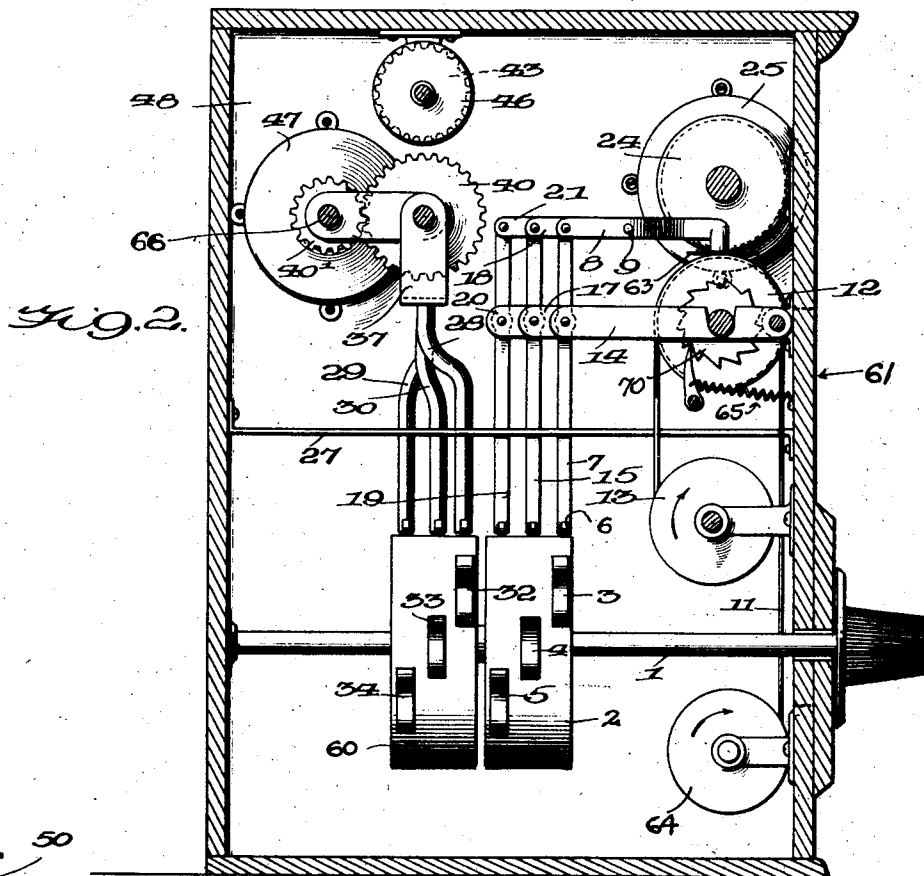
C. W. HOUGH

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3 Sheets-Sheet 2



Inventor
Clinton W. Hough,

John B. Brady
Attorney

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C. W. HOUGH

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WIRED RADIO PROGRAM APPARATUS

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3 Sheets-Sheet 3

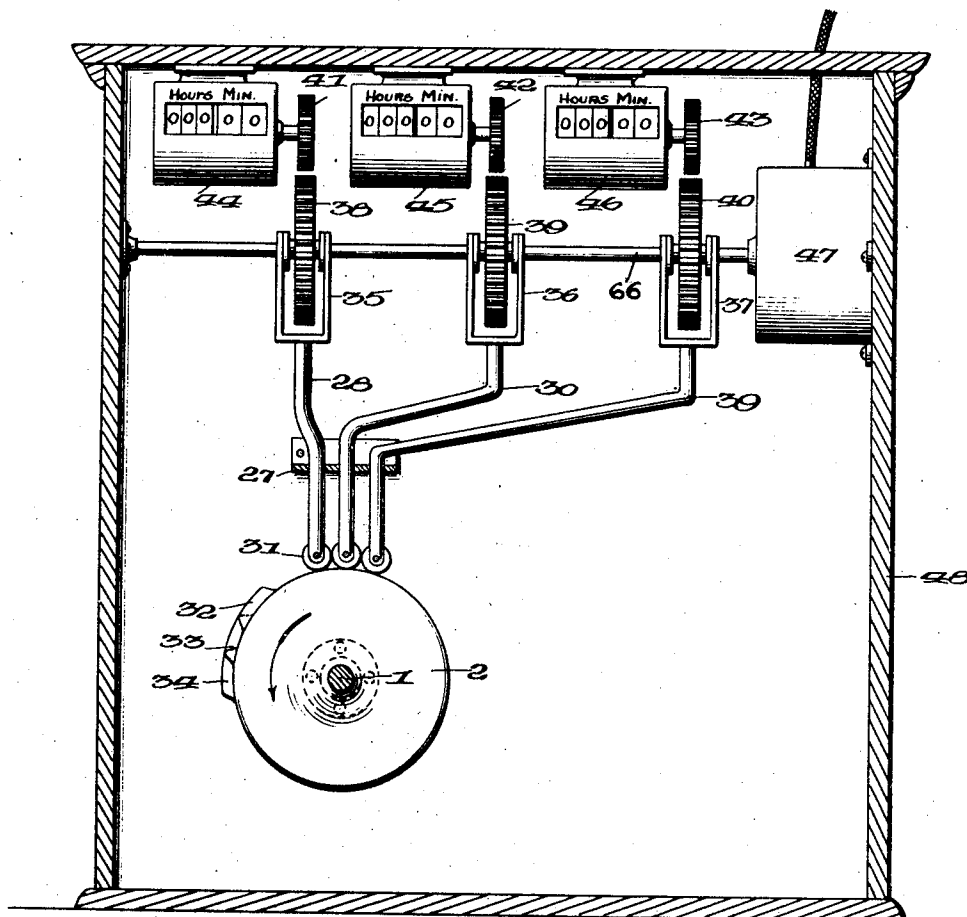


Fig. 3.

Inventor
Clinton W. Hough,

By John O. Brady
Attorney

UNITED STATES PATENT OFFICE

CLINTON W. HOUGH, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO
FEDERAL TELEGRAPH COMPANY, A CORPORATION OF CALIFORNIA

WIRED RADIO PROGRAM APPARATUS

Application filed April 27, 1927. Serial No. 186,948.

My invention relates broadly to a system of radio broadcasting and more particularly to a recording apparatus for use with radio broadcast receivers for determining the relative choice of programs favored by different radio listeners.

One of the objects of my invention is to provide a construction of recording apparatus for operation in conjunction with a radio receiver for establishing a record of the likes or dislikes of radio listeners for different broadcast programs.

Another object of my invention is to provide a system for automatically recording the time periods over which a radio listener may elect to continue to receive the different programs from a radio broadcasting system for enabling the program manager to more effectively select the broadcast matter for the entertainment of a vast audience.

Other and further objects of my invention will be more fully understood from the specification hereinafter following by reference to the accompanying drawings in which:

Figure 1 is a perspective view of the apparatus which I provide for making a record of the likes and dislikes of the radio listeners; Fig. 2 is a cross-sectional view taken through the recording apparatus of Fig. 1; Fig. 3 is a cross-sectional view taken through the apparatus taken on line 3—3 of Fig. 2; and Fig. 4 shows the method of linking the recording apparatus with the radio receiver for securing a record of the extent of use to which the different programs may be placed.

In the transmission of radio or wired radio programs especially when these are to be paid for by subscribers to the service it is extremely important to know positively what items on the various programs appeal to the subscribers. The best index is whether or not the subscribers listen. If they enjoy program items they will listen to them, if not they will turn to other programs or turn off reception entirely. An index of the appreciation is the time during which the receiving sets are operated and when a program manager knows this the programs can

be arranged more effectively to meet the desires of subscribers.

In wired radio service three simultaneous programs are generally sufficient to supply the requirements of subscribers although additional channels may be supplied where necessary. If the subscriber does not care for the item on No. 1 program he can turn to No. 2 program. If he does not like that item he can turn to No. 3 program. If he does not like No. 3 by that time there will be another item on No. 1. By knowing what items the public listen to a program manager can cater to their tastes and make certain that he is supplying the items desired.

My invention comprises broadly a clockwork mechanism which may be spring driven or it may be driven from the "A" or "B" batteries of a receiving set or a separate battery or by the electric lighting current. This clockwork mechanism is the measure for elapsed time and definite time as well, so that the individual programs can be checked up from the studio transmission records. The clockwork mechanism is geared to drive recording wheel counters which record hours and minutes. A separate individual counter is provided for each program. These individual counters are thrown in and out of gear by the switch which controls the several channels of the receiver. When No. 1 program is turned on the corresponding time counter is connected and continues to integrate and record the time during which program 1 is being received. Likewise counters corresponding to programs 2 and 3 are connected when the control switch is turned to those programs. The different sets of time counters will then record the time during which the several programs have been received and they may be checked up by periodically reading the scales at frequent intervals.

The device of my invention may be built into the receiving set or form a separate attachment with operating controls connected to the program switch. This device measures and records the time during which each program is received and will give a measure of

the use of the service as a whole by adding the time of the separate counters, for example:

		Hr.	Min.
5	Program 1-----	20	40
	Program 2-----	10	20
	Program 3-----	1	30
		—	
		32	30

10 These records also show that so far as this subscriber is concerned Program 1 is twice as popular as Program 2 and that Program 3 is of very little interest to him.

15 By having a certain percentage of the receivers in a wired radio broadcasting system equipped with this device a general knowledge of the likes and dislikes of the subscribers may be obtained and the programs formulated accordingly. Where desirable all of the receivers may be similarly equipped.

20 The apparatus of my invention is intended to index the individual program numbers listened to by the subscriber. In this case the device is equipped with similar sets of counters which indicate actual date and time the counters being in the nature of type wheels arranged to print a record on a paper sheet. By pressing a paper tape against the counter the date and time are printed on the paper tape. In this instrument there are three sets of type wheels all running and driven by the clock mechanism and all indicating the actual date and time. Adjacent to these there is a paper tape which is moved forward one type and space width upon each operation. If the receiver is turned on to No. 1 program the operation of the switch would press the paper against the type wheels corresponding to Program 1 and the date and time at which this program was turned on would be recorded. When the switch is turned off the paper tape is again pressed against the type wheels and a record of the time impressed on the paper. The difference between the subsequent readings will be a measure of the time during which No. 1 program was received and by referring to the program record at the studio the actual program item or items received can be determined. Identical operations are effected when the other programs are switched on and off.

50 Instead of having three sets of time indicating type wheels only one set will serve the purpose and in this case, the date and time at which programs are turned on and off is preceded or followed by a letter, A, B or C or by numbers 1, 2 or 3 or by similar indicating signs so that the programs being received during each recorded interval may be determined. A refinement may be included by adding the word "Off" which is printed on the tape against the printed record made at the time the receiver is switched off. Suitable spaces are provided on the paper tape for the subscribers to make any pertinent

comments upon the program which might be desirable.

Referring to the drawings in more detail the recording apparatus is shown mounted within a cabinet structure 48. A main actuating shaft 1 is provided to which the drums 2 and 60 are keyed for rotation. These drums serve as controllers for the printing and time registering apparatus and are rotated in accordance with the movement of the control knob 55 illustrated diagrammatically in Fig. 4. The control knob 55 is the main actuator for the wired radio receiving apparatus the circuits of which have been diagrammatically illustrated indicating the equipment for three channel reception. Coupled circuits 51, 52 and 53 are provided under control of switches 57, 58 and 59 for selectively connecting such parts of the coupled circuits 51, 52 and 53 between the incoming power line connection 50 under control of switch 56 and the wired radio receiving apparatus 54 as will permit the selection of a particular signaling channel for wired radio reception. Movement of the main control 55 will effect corresponding movement of the drum controllers 2 and 60 for effecting actuation of the printing and time registering equipment which will be more fully explained hereinafter. The printing equipment includes type bars 8, 18 and 21 pivotally mounted at 9 carrying type characters 10, 22 and 23 at one end thereof which may be depressed against ribbon 63 for registering a character on the paper roll 11. These type bars are actuated by push rods 7, 15 and 19, respectively, each push rod having a roller 6 on the lower end thereof for establishing contact with the cams 3, 4 and 5. The paper roll carrier in the form of a reel and web mechanism having rollers 12, 13 and 64 is arranged for the passage of a paper strip bearing the desired printed record in a plane parallel to the rear panel of the cabinet structure 48 in a position where the paper strip may be viewed through the sight opening 61. The roll carrier 12 is raised simultaneously with the upward movement of any one of the push rods 7, 15 or 19 for the reason that the push rods individually carry the pivoted arm members 14, 17 and 20 in which the roll 12 is mounted. There is sufficient resiliency in the support of the roll 12 by virtue of the spring mechanism 65 to permit the paper to be pressed upwardly while the type bars are pressed downwardly for effecting an impression of a character on the paper strip. The push rods are individually operated by cam members 3, 4 and 5 which separately engage the roller member 6 on the ends of the push rods 7, 15 and 19. The cams 3, 4 and 5 are so shaped that the actuation of the type bars is momentary, that is when the shaft 1 is rotated for moving the switch mechanism in the wired radio receiver for

program No. 1 the push rod 7 will be actuated and an impression made on the paper roll by the type 10 against the paper strip 11. While the setting of the wired radio receiver remains set for program No. 1 the push rod 7 remains in its normal position in the center of cam 3 and then when the switch mechanism is shifted to channel No. 2 the type bar is again depressed by reason of the upper movement of plunger 7 thus establishing a mark on the paper strip at the beginning of the time that the listener switches to program No. 1 and at the conclusion of the listening period. For the purpose of providing a date and time record on the paper strip 11, I provide a printing mechanism represented at 24 which is actuated by a synchronized electric clock mechanism in casing 25. The reel and web mechanism for controlling the supply of the paper strip is mounted from the sides of the cabinet, one such mounting shaft being represented at 26.

Extending across the cabinet structure I provide a guide strip 27 for controlling the movement of the plunger rods 7, 15 and 19 and also the carrier rods 28, 29 and 30. These carrier rods each terminate in a roller member 31 which are actuated by cams 32, 33 and 34 on the surface of the drum 60. Yokes 35, 36 and 37 are carried by the rods 28, 29 and 30 and in each yoke there is journaled a gear 38, 39 and 40. The yokes are so suspended with reference to the main drive shaft 66 extending from the synchronized electric clock 47 that the gears 38, 39 and 40 may be driven at constant speed. The upward movement of any selected gear enables that gear to be revolved around a pivot such as pinion 40' in Fig. 2 into engagement with a pinion on a time register shaft. I have represented the registers at 44, 45 and 46 each having a separate pinion 41, 42 and 43, respectively. The upper movement of push rod 28 by virtue of engagement between cam 32 and roller 31 results in the meshing of gears 38 and 41 driving the time register 44 for registering the lapse of time during which the wired radio receiving apparatus is in use for the reception of a particular program. It will be observed that any one of the several time registers 44, 45 or 46 may be independently actuated throughout the time that the listener is employing the wired radio receiving apparatus for reception on a particular channel. The printing occurs only in the beginning and at the conclusion of the time period over which the listener is receiving a particular program on a selected channel, but the time recorder operates throughout the time interval that the listener is using the wired radio receiving apparatus on a particular channel. As soon as the control shaft 1 is moved to positions for programs on channels 2 or 3 the cams 4 and 5 are brought into operation for effecting momentary print-

ing upon the strip 11, while the time recorders are brought into operation for determining the time period over which the listener is receiving the wired radio program on any selected channel. The casing 48 may be provided with sight openings 67, 68 and 69 through which the observer may determine the readings of the time registers 44, 45 and 46, respectively. A sight opening 61 enables the observer to read the impressions on the paper strip and to write any remarks adjacent the record for any program, giving his opinion of the particular program item being received or just completed. The subscriber might write such items as "No interest", "Program too long", "Splendid", "Not good", "Good", or some other explanatory remarks which would be of service to the program manager when the broadcast entertainment is later analyzed by a review of the tape record. Sufficient paper strip may be placed on the rolls to enable the apparatus to be operated over a considerable period of time. The change of the switching mechanism by the subscriber in selecting a wired radio program operates to shift the paper roll through the pawl and ratchet mechanism 70, so that the consumption of the paper strip is relatively slow.

After a test apparatus of this kind has been left with the wired radio customer for a desired period of time the paper roll may be removed from the apparatus and a new roll inserted therein and the record checked up by the program manager in accordance with a permanent transmission record for determining the average opinions of subscribers for the wired radio service.

With this index of the likes and dislikes of the customers the program manager may revise the broadcast entertainment in line with the expressions of the subscribers.

While I have described my invention in one of its preferred embodiments, I desire that it be understood that modifications may be made and that no limitations upon my invention are intended other than are imposed by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. In a signal receiving apparatus a plurality of signal receiving circuits a tuning mechanism for adjusting the signal receiving circuits to a plurality of predetermined positions, printing mechanism actuated upon the setting of said tuning apparatus in any selected position, and means for recording the time at which said tuning apparatus was set into a selected position and the time at which it was set into another position for determining the time period over which any selected one of said signal receiving circuits is rendered effective for the reception of signals.

2. Signal receiving apparatus comprising a tuning system arranged to be set in a plurality of predetermined positions for the selective reception of a plurality of different programs, a rotary actuator arranged to be moved simultaneously with the adjustment of said tuning system, said rotary actuator carrying a plurality of came thereon, a plurality of type bars corresponding to the number of settings of said tuning apparatus, a reel and web mechanism for presenting a paper strip to a position adjacent said type bars, each of said type bars being arranged for independent actuation by a predetermined one of said cams when said rotary actuator is shifted in position for establishing a printed record at the beginning and the end of the adjustment of said tuning apparatus to a selected position.

3. In a signal receiving system, a tuning apparatus arranged to be adjusted to a plurality of predetermined positions for the selective reception of a particular program, a rotary actuator arranged to be moved simultaneously with the adjustment of said tuning apparatus, a plurality of cams arranged in echelon and carried by said rotary actuator, a plurality of type bars corresponding to the number of programs to be received, a strip member for receiving a printed record, said type bars being independently actuated by engagement of said cams upon movement of said rotary actuator for impressing a printed record upon said strip member upon the initial setting of said tuning apparatus to a predetermined position and upon the movement of said tuning apparatus from said predetermined position.

4. In a multiplex signal receiving system a multiple position electrical switch, a plurality of independent signal receiving circuits, said switch being movable to positions corresponding to individual signal circuits, printing mechanism operative upon the movement of said switch from one position to another position to record the time of each switch movement, means for registering the time lapse between each of said switch movements and a multiplicity of cams shiftable in position to render said printing mechanism and said registering means operative simultaneously.

In testimony whereof I affix my signature.
CLINTON W. HOUGH.

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