

July 23, 1940.

H. R. BUTLER

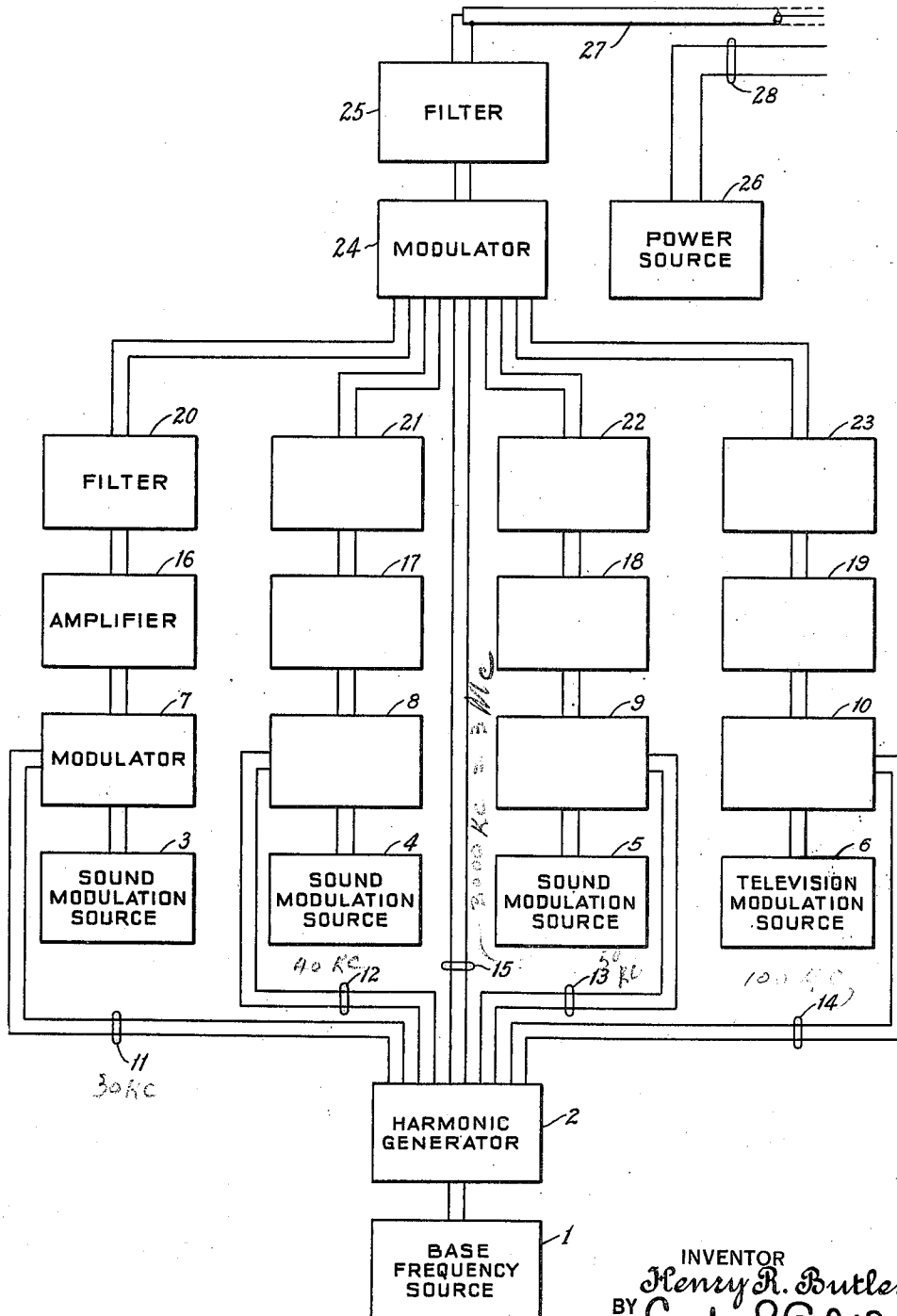
2,208,922

WIRED RADIO TELEVISION DISTRIBUTION SYSTEM

Filed March 15, 1938

2 Sheets-Sheet 1

Fig. 1



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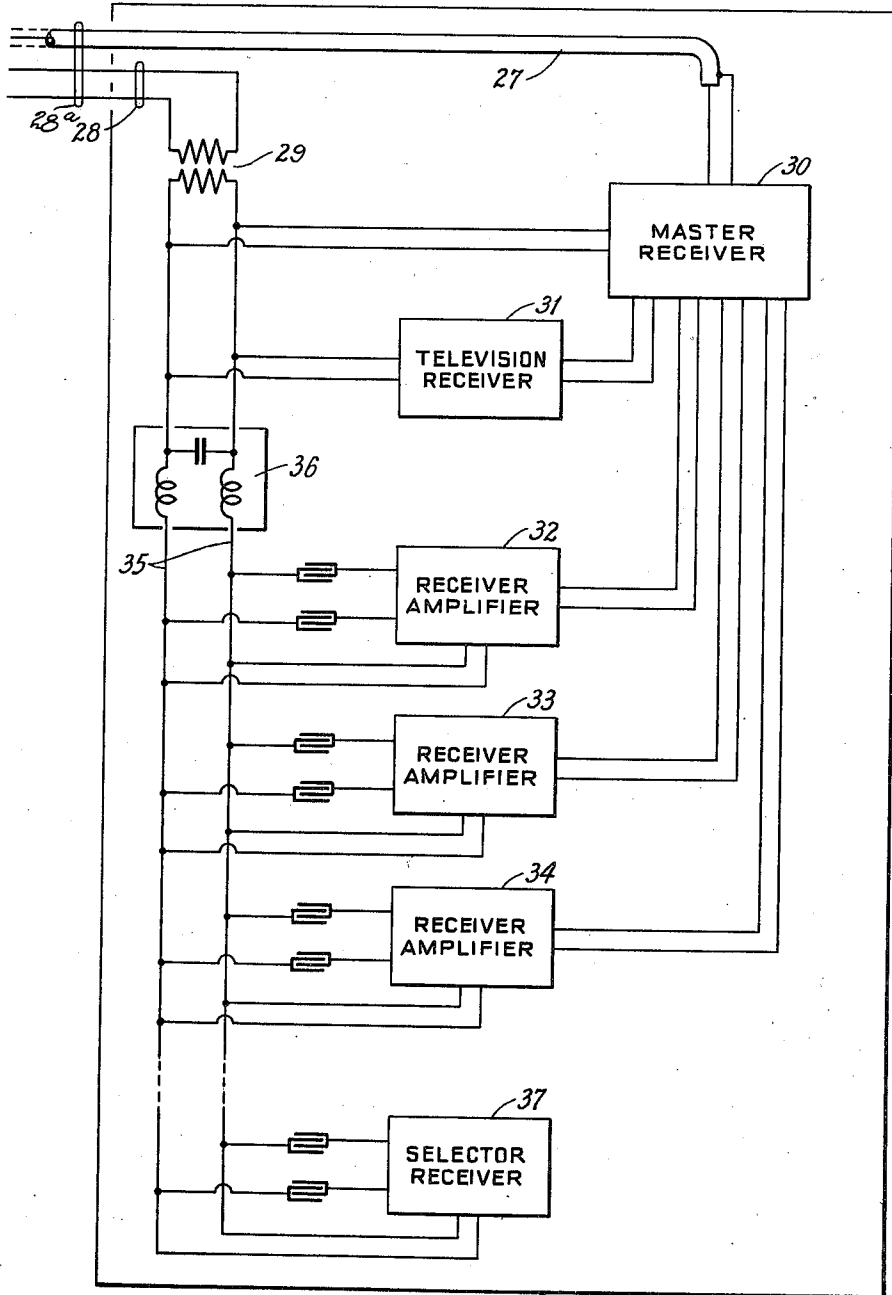
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FIG. 2



CONSUMER'S PREMISES

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WIRED RADIO TELEVISION DISTRIBUTION
SYSTEMHenry R. Butler, Verona, N. J., assignor to Wired
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1 Claim. (Cl. 178—5.8)

This invention pertains in general to wired radio signal distribution systems and specifically relates to a system for the combined transmission of sound and television programs.

The principal object of the invention comprises providing an arrangement for utilizing a common transmission medium for the simultaneous transmission and reception of a plurality of different program channels, at least one of which comprises television signals.

A further object comprises providing a system for transmitting sound and television signals by carrier frequencies all having a definite harmonic relationship.

A still further object of the invention comprises providing a system for independently producing a plurality of modulated high frequency program signals and then utilizing all of such signals to further modulate a master transmission frequency for transmitting all of the program signals over a common transmission medium of wide range frequency characteristics, such as a co-axial cable.

These and other objects will be apparent from the following, taken in conjunction with the appended drawings in which like reference numerals designate corresponding parts and in which:

Fig. 1 is a schematic representation of one embodiment of the transmission system of the invention, showing apparatus units connected in a preferred arrangement; and

Fig. 2 is a schematic representation of a typical reception station for receiving and utilizing the signals transmitted by the arrangement of Fig. 1.

Referring to the drawings in detail, a base frequency source 1 generates a master base frequency such as, for example, 10 kilocycles. The base frequency source 1 may be any conventional circuit known in the art, such as a crystal controlled electron tube oscillator, for producing a sustained wave of the frequency indicated.

The output of the base frequency source 1 is delivered to harmonic generator 2 comprising conventional circuit arrangements for producing a multiplicity of harmonics from the wave generated by the base frequency source 1. These harmonics are individually delivered to modulators 7—10 over connections 11—14. By way of example, the harmonic frequencies delivered over 11—14 may be 30, 40, 50 and 100 kilocycles, respectively. Sound modulation sources 3, 4 and 5, respectively provide sound modulation signals to the modulators 7—9 to signal modulate the

carrier frequencies delivered thereto. The signal modulated high frequency energy from modulators 7—9 then is delivered to amplifiers 16—18 and thence to filters 20—22. Filters 20—22 restrict the outputs of amplifiers 16—18 so as to ensure that the modulated carrier frequencies lie within the proper frequency channels and do not overlap or interfere with one another.

A television modulation source 6 comprises conventional means for producing television signals in accordance with the unit light values of a field of vision. These signals are delivered to the modulator 10 so as to signal modulate the carrier frequency delivered thereto over connections 14 so that the output of modulator 10 comprises television signal modulated high frequency energy. This output of modulator 10 is delivered to amplifier 19 and thence to filter 23 which operates to properly restrict the frequencies and prevent harmonics or other interference with respect to the other program or signal channels.

In accordance with the invention, the output of filters 20—23 are delivered to modulator 24 which receives a super-carrier frequency over connections 15 from the harmonic generator 2. By way of example, this super-carrier frequency may be 3000 kilocycles. The modulator 24 therefore causes the carrier frequencies and their attendant modulation side bands from filters 20—23 to modulate this super-carrier frequency as a side band of modulation frequencies. This modulated, super-carrier frequency is then delivered through a filter 25, which eliminates harmonics and properly restricts the frequency range which is impressed on co-axial cable 27 for transmission purposes.

In accordance with the invention, a power source 26 develops commercial power such as 60 cycle alternating current which is transmitted over cable 28. Cable 28 may be disposed co-extensively with cable 27 in the conduits of a power distribution network as indicated at 28a in Fig. 2. This combined power distribution and television network is connected with a multiplicity of consumers' premises, one of which is depicted in Fig. 2.

Referring to Fig. 2, the power cable 28 is connected through power transformer 29 and suitable service equipment, not shown, to supply operating voltages to a master receiver 30. The master receiver 30 has high frequency reception circuits with broadly tuned receiving characteristics for receiving the complexly modulated super-carrier frequency from modulator 24. The master receiver 30 includes a plurality of dif-

ferent filter circuits for selectively segregating the frequency components and separately delivering the television frequencies to a television receiver 31, while delivering the sound modulation program signals to the receiver amplifiers 32—34. The receiver 30 may include a detection device for detecting the super-carrier frequency to derive therefrom the modulation frequencies separately delivered to the receivers 31—34. The television receiver 31 includes a power connection from the transformer 29 to provide operating voltages for reproduction of the television programs.

The receiver amplifiers 32—34 respectively amplify and impress the program signals upon the consumer's power network 35 connected through a signal blocker 36 to the transformer 29. The sound program signals are then transmitted as carrier frequencies over power circuit 35 for reception by various sound receivers such as the receiver 37, which is selectively operable to receive any one of the sound programs. This sound receiver 37 may be positioned adjacent the television receiver 31 or may be disposed in other parts of consumer's premises. It will be understood that the consumer's premises may comprise various types of distribution stations, such as, for example, an apartment house, an office building, or a hotel.

By the foregoing system, it is possible to transmit plural programs including sound and television systems to a multiplicity of consumers with great fidelity and flexibility of program arrangement. Although a preferred form of the system has been disclosed, it will be recognized that various changes can be made without departing from the intended scope of the invention. Therefore, no limitation is intended except as pointed out in the appended claim.

What is claimed as new and original to be secured by Letters Patent of the United States is:

A receiving system for a plurality of sound modulated carriers and a television modulated carrier all modulated on a super-carrier, said system comprising a master receiver for deriving and segregating the sound and television modulated carriers from said super-carrier, a television receiver connected to said master receiver and adapted to reproduce the television modulation, a plurality of amplifiers connected to said master receiver for amplifying the respective sound modulated carriers, a power distribution circuit, means for impressing said amplified carriers upon said circuit, and a selective receiver coupled with said circuit for selectively deriving therefrom the sound modulations.

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