

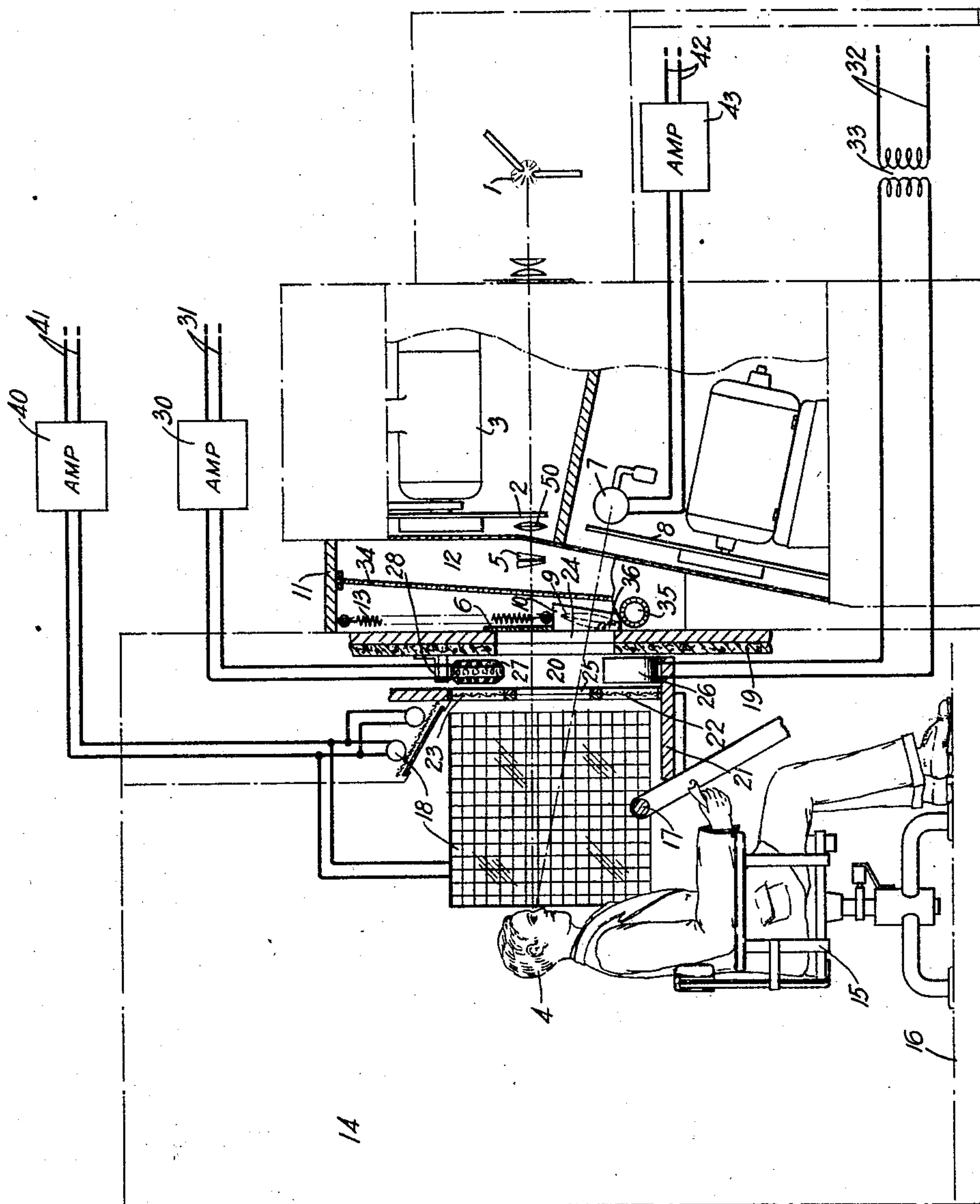
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COMMUNICATING SYSTEM

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COMMUNICATING SYSTEM

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This invention relates to communicating systems and more particularly to those which embody simultaneous two-way television and signal transmission.

5 An object of the invention is to enable at least two people while being televised to converse with each other by telephone instruments, which do not interfere with the production of a full-face image of each party in
10 the line of vision of the other and so placed as to produce the illusion of a face-to-face conversation.

Another object is to arrange the telephone instruments so that the energy transferred
15 between them is insufficient to cause singing.

Still another object is to place the telephone receiver so that the voices appear to emanate from the respective images.

20 A typical embodiment of the invention comprises, at each station, an apparatus for effecting spot scanning of an observer's face and an image producing apparatus associated with a booth having a pick-up microphone and a loud speaker built into the wall.
25 The microphone and speaker are directly in front of the observer in a compartment, closed by a curtain which permits ready transfer of sound waves between the observer and the telephone instruments, but so that the energy
30 transference between the instruments is low. This is effected by placing the microphone and loud speaker with their axes parallel. The speaker is as close to the image as possible, and the portion of the curtain in front
35 of the speaker is treated with material tending to increase its damping. The walls of the booth are treated to reduce the reflect of sounds from the walls into the microphone. The net effect is that the energy transferred
40 between the telephone instruments is insufficient to cause singing, distortion of the speech by reverberation in the booth is prevented and the voice appears to originate at a point where the image appears.

45 A detailed description of the invention follows and is illustrated in the drawing, which comprises a single figure illustrating a terminal equipment partly diagrammatically and partly in section.

50 The present invention is designed to be in-

corporated in the system described in detail in the application of H. E. Ives Serial No. 442,503, filed April 8, 1930. The invention is also closely related to that disclosed in the application of D. G. Blattner, Serial No. 55 442,487, filed April 8, 1930.

Referring to the figure there is shown a scanning mechanism designed and operated in the manner disclosed in application Serial No. 227,649, filed October 21, 1927, by F. 60 Gray as a continuation of his application, Serial No. 111,731, filed May 26, 1926. The scanning apparatus comprises a source of light, a scanning disc 2 provided with a spiral row of apertures and driven by a motor 3, and
65 a beam directing lens in the housing 5.

Briefly the light source, disc and directing lens cooperate to produce and direct a beam of light for successively illuminating the elemental areas of the face of the observer 4, during each revolution of the disc. The latter is driven at such speed that the complete scan-
70 nings are repeated at a rate corresponding to the persistence of vision.

The light beam emerging from the directing lens 50 passes through a variable angle prism 5 for adjusting its direction with respect to the observer. The path of the beam also includes a color filter 6, for freely transmitting blue light and suppressing light of
80 other wave lengths to minimize interference with the vision of the observer. Yellow and green rays have the greatest tendency to "blind" the observer, since the eye is most sensitive to these rays. 85

The apparatus for reconstructing an image of the occupant of the other booth comprises a glow lamp 7, associated with a disc 8 provided with a spiral row of apertures through which the observer views the glow area of
90 the lamp. The incoming image current wave is supplied to the lamp 7 over the circuit 42 through the amplifier 43 to vary the intensity of the light supplied by it, in accordance with the tone values of the elemental
95 areas of the face of the occupant of the other booth.

The image field is magnified by a lens 9, mounted in a carrier 10 which may be raised and lowered to align the lens with the lamp 100

and the eye of the observer. The lens is adjusted by means of a knob 35 mounted on a shaft carrying a worm gear which meshes with a rack 36 secured to the carrier 10.

5 The lens carrier is suspended from the top 11 of a cabinet 12 by springs 13. The cabinet is situated at the rear of a booth 14 occupied by the observer.

10 The booth is indicated by dotted lines, except for the portion facing the observer's position, which is shown broken away and in section.

The observer occupies a chair 15 fixed to the floor 16 so that he faces the scanning and image producing mechanism.

15 At both sides and in front of the chair are compartments 18 lined with shielding material and provided with transparent windows on the side adjacent the chair. These compartments enclose groups of photoelectric cells which are actuated by light reflected from the face of the observer and are connected in parallel to an amplifier 40 and a circuit 41 through which the image current wave is supplied for transmission to another station.

20 The chair 15 is so placed that, when occupied by a person of average stature, he will be in the optimum position for scanning purposes. The magnifying lens 9 is used to produce an image which appears to be some distance back of the lamp.

25 Directly in front of the observer's position, there is a compartment 20 constituted by the wall 19, a shelf 21, and a screen 22 mounted in a frame 23.

30 The wall 19 is provided with an opening 24 and the screen 22 carries a light transparent window 25. The scanning beam passes through the upper portion of the opening 24 and window 25, and the image of the other observer is viewed through the lower portion.

Upon the shelf 21, between the wall 19 and screen 22, is a loud speaker 26.

35 Adjacent the top of the opening 24 is a microphone 27 mounted on a bracket 28.

The microphone 27 and loud speaker 26 have their axes parallel so that there is no direct transfer of sound waves from one to the other. To aid in giving the illusion that the sound emanates from the image, the axes of the microphone and loud speaker lie in a vertical plane passing through the middle of the opening 24.

40 The screen 22 is made of fibrous material stretched upon the frame 23, so that it does not serve to transmit sound waves between the microphone and loud speaker. The loud speaker is also placed as close as possible to the image position to assist the illusion that the voice emanates from the image. The illusion of a face-to-face conversation may be enhanced by using material for the screen which tends to dampen the sound waves

whereby the voice appears to originate at the point where the image is formed.

Speech currents produced by the microphone are amplified in the amplifier 30 and transmitted over a channel, illustrated by way of example as a line 31, to a loud speaker, corresponding to 26, at the other station.

70 Speech currents originating in the microphone corresponding to 27, at the other station arrive via a communication channel, herein exemplified as a line 32, and are transferred through the transformer 33 to the loud speaker 26.

80 A glass partition 34 excludes noises, produced by the motors, discs, etc. from the booth and thereby prevents them from interfering with the operation of the telephone instruments and from annoying the occupant of the booth.

85 The present invention provides a system in which two parties may carry on a telephone conversation while each has an unobstructed view of a complete image of the face of the other, and their voices appear to emanate at a point where the respective images are formed, whereby the illusion of a face-to-face conversation is materially enhanced.

What is claimed is:

95 1. A combined telephone and simultaneously operable two-way television system including a plurality of stations, a booth at each station, an image integrator and analyzer associated with each booth and operative with respect to a person therein, and telephone instruments in each booth but out of range of said analyzer.

100 2. A combined telephone and simultaneously operable two-way television system comprising a plurality of stations each having a booth, means for presenting an image of an object to an occupant of said booth and for scanning a field within said booth, and telephone instruments outside the field of said scanning means.

110 3. A combined telephone and simultaneously operable two-way television system comprising a plurality of stations each having a booth, means for scanning an occupant of said booth and for presenting an image of another party to the occupant's view, and a pick-up microphone and loud speaker outside the field of said scanning means.

120 4. A combined telephone and simultaneously operable two-way television system comprising a plurality of stations each having a booth, means for scanning an occupant of said booth and for presenting to said occupant an image of a party at another station, and a loud speaker adjacent said image.

125 5. A combined telephone and simultaneously operable two-way television system comprising a plurality of stations each having a booth, means for scanning an occupant of said booth and for presenting an image

of another party to the occupant's view, a pick-up microphone and a loud speaker within said booth, and means for mounting said microphone and loud speaker to reduce
5 the energy transfer therebetween to a minimum.

6. A combined telephone and simultaneously operable two-way television system comprising a plurality of stations each having a booth, means for scanning an occupant
10 of said booth and for presenting an image of another party to the occupant's view, a pick-up microphone and loud speaker and means for reducing to a minimum the energy transferred between said microphone and
15 loud speaker.

7. A combined telephone and simultaneously operable two-way television system comprising a plurality of stations each having a booth, means for scanning an occupant
20 of said booth and for causing an image of a party at another station to appear to said occupant, and a loud speaker closely adjacent said image, and outside the range of said
25 scanning means.

In testimony whereof, I have signed my name to this specification this 28th day of March, 1930.

RALZEMOND D. PARKER.

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