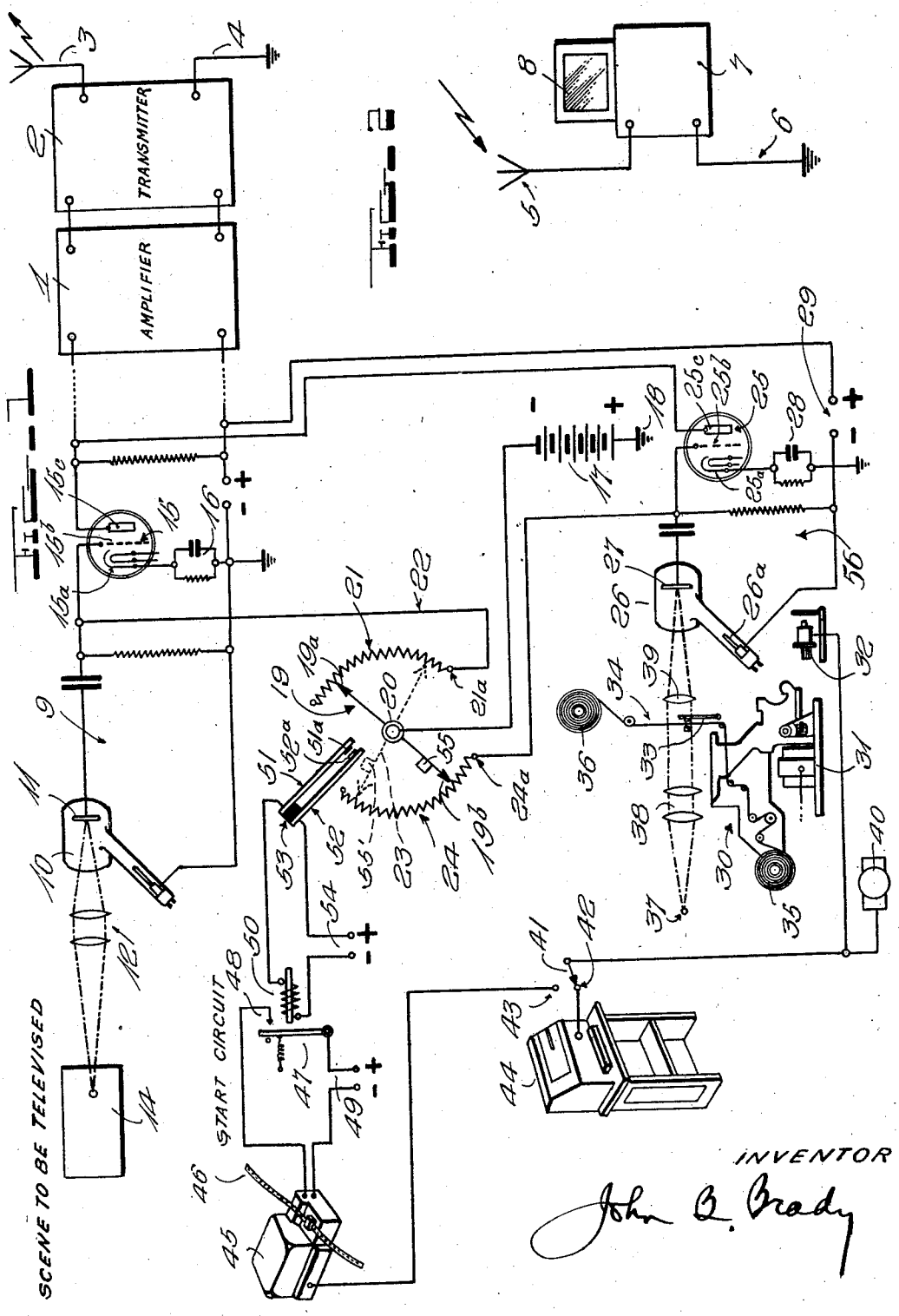
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FACSIMILE TRANSMISSION SYSTEM

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FACSIMILE TRANSMISSION SYSTEM

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6 Claims. (Cl. 178—7.2)

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My invention relates broadly to transmission systems, and more particularly to a composite facsimile and television transmission system.

One of the objects of my invention is to provide a composite system of facsimile and television transmission in which news transmissions may be interspersed with television scenes or pictures.

Another object of my invention is to provide a combined facsimile television transmission system in which televised picture transmissions and facsimile transmissions may be alternately merged one into the other for activating the television transmission channel by either facsimile or television transmission.

A further object of my invention is to provide a composite facsimile and television transmission system in which a transmission channel may be activated selectively by either television transmission impulses or facsimile transmission impulses with means for fading the impulses of one type with respect to the impulses of other type in the control of the transmission channel.

Still another object of my invention is to provide a circuit arrangement for a composite printing telegraph and television transmission system for operation into a transmission channel, including printing telegraph apparatus having means for starting and stopping the printing telegraph apparatus when the transmission channel is conditioned to transmit news items as distinguished from picture subjects and the operation of the printing telegraph apparatus discontinued when the transmission channel is conditioned for the resumption of the transmission of picture subjects.

Still another object of my invention is to provide a composite printing telegraph and television transmission system including a printing telegraph optical projector system, including means for controlling the transmission of news, character by character, and line by line intermediate picture transmissions of televised scenes.

Other, and further objects of my invention reside in the circuit arrangement for the alternate control of a transmission channel by televised scenes and printing telegraph news distributions, advertisements, or printed descriptions for reproduction at a television receiver, as set forth more fully in the specification hereinafter following by referring to the accompanying drawings, in which:

Figure 1 is a diagrammatic and schematic view of the composite facsimile and television transmission system of my invention; and Fig. 2 schematically shows a television receiver for reproducing in alternate arrangement televised scenes and printing telegraph news distributions.

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My invention is directed to a transmission system for the composite transmission of televised scenes and printing telegraph news distributions. In the operation of television transmission and reception systems it is desirable to provide for the customer television reproduced scenes interspersed with news distribution items.

My invention provides a transmission system in which the transmission channel may be alternately controlled by a television camera circuit for the transmission of televised scenes, or by a printing telegraph optical projector controlled system of the type set forth in my co-pending application, Serial No. 598,135, filed June 7, 1945, for Printing telegraph transmission and reception system, now Patent No 2,420,029, of May 6, 1947.

The instant invention provides means for conditioning either of the two types of controlled systems for activating the transmission channel, and the fading of one control system into the other for giving the effect on the remote television pickup receivers of the decreasing of the television scene reproductions and the increasing of the news distribution reproductions, and vice versa.

My invention also contemplates the control of the printing telegraph apparatus for starting and stopping printed telegraph transmissions while the transmission channel is conditioned for the distribution of news items, and blocked with respect to the transmission of televised scenes. By the arrangement of my invention it is practical to intersperse televised scenes, printed announcements, news items, advertisements, descriptions and explanations of the related television scene for supplying to the customer or subscriber a program of greater educational or entertainment value.

Referring to the drawings in detail, the transmission channel is represented as including an amplifier 1 which is connected to a television transmitter, including a standard modulation, oscillation and power amplification equipment 2 connected to an antenna ground system 3—4. It is understood that a co-axial cable or line wire distribution system may be substituted for the antenna ground circuit 3—4 for transmission to the standard television receiving system represented in Fig. 2. The standard receiving system shown in Fig. 2 may include antenna ground system 5—6 connected to television receiver 7, provided with a television picture reproducing tube, such as, a kinescope arranged for the reproduc-

tion of images on a large screen represented at 8.

The control channel for the transmission of television scenes is designated generally at 9, including the television picture transmission tube 10, such as, the iconoscope or the orthicon, including a mosaic 11, upon which there is focused through optical system 12 the image of the object 14 which is being televised. The associated horizontal and vertical deflector circuits and the synchronizing amplifier have been omitted for simplification, but it will be understood that the television transmisison control circuit 9 includes the customary deflection and synchronizing circuits for rendering effective upon the transmission channel 1—2 signal impulses according to the television scene to be transmitted.

Intermediate the television control circuit 9 and the input amplifier 1, I provide a coupling circuit comprising electron tube 15 which may include at least the cathode 15*a*, grid 15*b*, and anode 15*c*, wherein the television control circuit connects to the cathode 15*a* through suitable bias control circuit 16 to the control grid 15*b*, and wherein the output circuit from anode 15*c*, and cathode 15*a* is connected to the input of amplifier 1. The television control circuit 9 is rendered effective, or ineffective upon input amplifier 1 leading to the transmission channel according to the condition of the coupling tube circuit 15 through the bias control system including source of bias potential 17 connected to ground 18 at the positive side and connected at the negative side thereof to the angularly movable switch arm 19 pivoted at 20. Switch arm 19 projects in opposite directions from the pivotal mounting 20 thereof, the contactor end 19*a* of arm 19 being slideably and variably operative over high resistance 21. High resistance 21 has the terminal 21*a* thereof connected thru lead 22 to the grid 15*b* of coupling tube 15. Thus, the effect of the bias potential source 17 upon grid 15*b* is practically nil in the full line position of arm 19 as shown, with substantially all of high resistance 21 in the grid circuit of tube 15, whereas upon shorting out high resistance 21 with the arm 19 in full line position 23, the bias potential from source 17 becomes effective to block the operation of coupling tube 15, thereby preventing television signal impulses from the television control circuit 9 from being impressed upon the input of amplifier 1.

The opposite end of arm 19 terminates in slideable contactor 19*b*, operative over high resistance 24 which connects at the end 24*a* thereof to the grid 25*b* of coupling tube 25 in the second of the control circuits leading to the input of amplifier 1 of the television transmission channel.

The second of the control circuits includes a television image transmitting tube 26, such as an iconoscope or orthicon, having mosaic 27 connected to the input circuit of coupling tube 25, that is, to grid 25*b* and to cathode 25*a* from the electron gun 26*a* through biasing circuit 28. The output circuit of coupling tube 25 leading from anode 25*c*, and cathode 25*a* through potential source 29 is connected to the input circuit of amplifier 1.

The picture tube 26 is mounted so that the mosaic 27 thereof is supported in the optical path through the printing telegraph projector apparatus shown generally at 30. The printing telegraph projector apparatus has been explained more fully in my copending application, Serial No. 598,135, filed June 7, 1945, now Patent No. 2,420,029 of May 6, 1947, supra, and it is believed sufficient to set forth herein the fact that the printing telegraph projector unit comprises a Baudot code page printer unit operated by driving motor designated at 31 and including a selector magnet system designated at 32 for operating through various permutations and combinations the type bars 33 of the printer unit which are selectively operated to imprint signal characters on the transparent web 34. The transparent web 34, is supplied from a feed roller 35 through a multiplicity of guide rollers to the take up roller 36. The transparent web is approximately 5½ inches in width, and the typing unit operates transversely of the web to transverse positions for a distance sufficient for imprinting approximately 45 characters per line on the transparent web 34.

A light source 37 is focused through the optical system 38 and the light transparent web 34, and through optical system 39 upon the mosaic 27. The size and shape of mosaic 27 is selected to substantially contain the multiple number of lines of printing which are produced upon the transparent web 34 within the optical path focused therethrough from light source 37. The mosaic 27 is thus subjected to the image of the lines of type produced upon the light transparent web 34 character by character as the printing telegraph message is produced, and line by line as the several lines of typing advance through the optical path embraced by the optical systems 38 and 39. The image of the multiplicity of lines of typed characters on transparent web 34 substantially covers the entire surface of the mosaic 27 which is shaped to receive the pattern formed by the typed characters.

Simultaneously with the operation of selector magnet system 32, I provide for the operation of monitoring type printer 40 with Baudot code, in order to determine at the telegraph printer optical projector unit 30 the printing telegraph messages that are being typed on the light transparent web 34. Inasmuch as the printing telegraph optical projector unit 30 and image-receiving television tube 26 are mounted in close association in a cabinet structure, it is not practical to visually read the typing which is being reproduced on the light transparent web 34 while the apparatus is functioning in the control of the transmission channel, so that the monitoring printer 40 provides a permanent record of the transmissions which appear on the light transparent web 34.

The printing telegraph optical projector unit 30 is controlled from any suitable source of Baudot code printing telegraph signals. A selector switch 41 is provided operative over various contact positions, such as, 42 and 43. In contact position 42 the printing telegraph receiver unit 30 is directly controlled from the manually operated keyboard of the page printer unit 44. Thus, an operator in manipulating the keys of the page printer unit 44 is able to make a home record of the typed message on the receiving portion of the page printer unit 44, and at the same time operates at the remote position in which the transmission station is located, the monitoring tape printer 40, and the receiving telegraph printer optical projector unit 30.

In lieu of the direct keyboard control provided by the page printer unit 44, I may provide for the automatic control of the printing telegraph optical projector apparatus 30 from the transmitter distributor unit 45 which may be connected to the circuit of the printing telegraph optical

projector system 30 by moving selector switch 41 to position 43 and conditioning the transmitter distributor. The transmitter 45 includes the standard tape-sensing mechanism controlled by perforated tape 46 which passes through the tape transmitter mechanism. The transmitter distributor 45 is started and stopped through a control circuit which includes movable armature 47, contact 48 and source of potential 49.

Armature 47 is controlled from electro-magnetic winding 50 which connects to the leaf springs 51 and 52, supported in insulated spacial relation through insulation member 53 and normally maintained with their coacting contacts 51*a* and 52*a* open, the circuit to the electro-magnetic winding 50 being completed through source of potential indicated at 54. The leaf springs 51 and 52 are located adjacent the end limit of travel of arm 19 of the circuit controller. The arm 19 carries a cam-like projection 55 thereon which is movable into abutment with the leaf spring 52 when the arm 19 is moved to the extreme limit of operation thereof, as shown by dotted lines 23. In this position the cam-like projection at 55 is about to move leaf spring 52 to a position in which contact 52*a* establishes connection with contact 51*a*. When such circuit closure occurs, electro-magnetic winding 50 is energized, moving armature 47 to a position closing contact 48 and starting the transmitter distributor 45 which operates through contact 43 and switch arm 41 to control the selector 32 of the printing telegraph optical projector unit 30, and also the monitor tape printer 40.

Thus, automatic transmissions may be continued so long as tape 46 feeds through the transmitter distributor for automatically shutting down the printing telegraph transmission at the end of the tape feed out, or until the operator moves arm 19 to a position opening contacts 51*a* and 52*a*, and applying a heavy biasing potential on grid 25*b* of coupling tube 25 while reducing biasing potential on grid 15*b* of tube 15. This has the effect of blocking the printing telegraph control channel 56 while opening the television picture control channel 9 to the transmission control system 1—2.

Inasmuch as the printing telegraph message displayed on web 34 remains in the optical path of the mosaic 27 of television tube 26, even after the transmissions to the printing telegraph optical projector unit 30 have ceased due to the stop condition exercised by the selector 32, the printing telegraph message is gradually faded out of the distant, or remote television receiver screen 8 while the television picture scene from objective 14 is faded into the television picture screen 8 of the receiver.

In order to simplify the diagram and yet set forth the principle involved, I have omitted from the circuit of tube 26 the vertical and horizontal deflector circuits and the synchronizing circuits as it will be understood that such circuits are conventional.

I have referred to the transmitter distributor unit 45 merely by way of example of a Baudot code transmitter control unit. It will be understood that the transmitter in the position 45 may be a reperforator transmitter control unit, or other form of automatic station control equipment.

The system of my invention is operative either for direct studio transmission control in radio broadcasting or remote control in chain broadcasting, and for this reason I have indicated the circuits from the two control channels to the amplifier 1 in dotted lines to represent the distance over which the remote control lines may extend to any number of transmission channels for multiple simultaneous transmission from geographically separated locations for thus serving large areas with news items in addition to televised pictures.

My invention also has military application in the alternate transmission of both map or pictorial data and printed orders. The map or pictorial data may be transmitted from one control circuit while the printed orders are being prepared for transmission from the other control circuit.

I realize that other methods may be employed in carrying out the alternate conditioning of the two transmitter control circuits leading to the transmission channel according to the principles of my invention. And while I have described my invention in one of its preferred embodiments, I desire that it be understood that no limitations upon my invention are intended other than may be 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. A printing telegraph transmission system comprising a printing telegraph receiver for reproducing telegraphic messages on a transparent web, a light sensitive mosaic arranged in an optical path adjacent the light transparent web, a light beam focused through said transparent web in said optical path upon said light sensitive mosaic for reproducing images of the telegraphic messages from said transparent web upon said light sensitive mosaic, a transmitter distributor for controlling the operation of said printing telegraph receiver, a start stop circuit for said transmitter distributor including a switch, a transmission channel connected with said light sensitive mosaic and means operative in one position for conditioning said transmission channel for transmission prior to the starting of said transmitter distributor and in another position for closing said switch for starting said transmitter distributor and initiating said printing telegraph receiver in operation subsequent to the conditioning of said transmission channel for transmission.

2. A printing telegraph transmission system comprising a printing telegraph receiver for reproducing telegraphic messages on a transparent web, a light sensitive mosaic arranged in an optical path adjacent the light transparent web, a light beam focused through said transparent web in said optical path upon said light sensitive mosaic for reproducing images of the telegraphic messages from said transparent web upon said light sensitive mosaic, a transmitter distributor including a perforated tape telegraphic control means for producing permutation and combination signal impulses for operating said printing telegraph receiver, a start stop circuit including a contactor for initiating and halting the operation of said control means, a transmission channel connected with said light sensitive mosaic and means operative in one position for conditioning said transmission channel for transmission prior to the initiation of the start stop circuit of said transmitter distributor into operation and operative in another position for actuating said contactor for operating said printing telegraph receiver subsequent to the conditioning of said transmission channel.

3. A printing telegraph transmission system comprising a printing telegraph receiver for re-

producing telegraphic messages on a transparent web, a light sensitive mosaic arranged in an optical path adjacent the light transparent web, a light beam focused through said transparent web in said optical path upon said light sensitive mosaic for reproducing images of the telegraphic messages from said transparent web upon said light sensitive mosaic, a transmitter distributor including a perforated tape telegraphic control means for producing permutation and combination signal impulses for operating said printing telegraph receiver, a start stop circuit including a circuit controller for initiating and halting the operation of said control means, a transmission channel connected with said light sensitive mosaic, and means operative in one position for rendering said mosaic effective upon said transmission channel prior to the activation of said perforated tape telegraphic control means and operative in another position for actuating said circuit controller for activating or deactivating said perforated tape control means before said mosaic is rendered ineffective upon said transmission channel.

4. A printing telegraph transmission system comprising a printing telegraph receiver for reproducing telegraphic messages on a transparent web, a light sensitive mosaic arranged in an optical path adjacent the light transparent web, a light beam focused through said transparent web in said optical path upon said light sensitive mosaic for reproducing images of the telegraphic messages from said transparent web upon said light sensitive mosaic, a transmitter distributor including a perforated tape telegraphic control means for producing permutation and combination signal impulses for operating said printing telegraph receiver, a start stop circuit including a switch for initiating and halting the operation of said control means, a transmission channel, a coupling tube circuit including an electron tube having at least a cathode, a control grid and an anode, an input circuit interconnecting said mosaic said control grid and cathode, an output circuit interconnecting said transmission channel said anode and cathode, and means operative in one position for biasing said control grid for effectively conditioning said input circuit for transmitting image signal impulses from said mosaic into said transmission channel prior to the initiation into operation of said start stop circuit of said transmitter distributor and in another position for operating said switch for initiating said transmitter distributor into operation for operating said printing telegraph receiver subsequent to the conditioning of said transmission channel.

5. A printing telegraph transmission system comprising a printing telegraph receiver for reproducing telegraphic messages on a transparent web, a light sensitive mosaic arranged in an optical path adjacent the light transparent web, a light beam focused through said transparent web in said optical path upon said light sensitive mosaic for reproducing images of the telegraphic messages from said transparent web upon said light sensitive mosaic, a transmitter distributor including a perforated tape telegraphic control means for producing permutation and combination signal impulses for operating said printing telegraph receiver, a start stop circuit for

initiating and halting the operation of said control means including a switch, a transmission channel, a coupling tube circuit including an electron tube having at least a cathode, a control grid and an anode, an input circuit interconnecting said mosaic said control grid and cathode, an output circuit interconnecting said transmission channel said anode and cathode, and means operative in one position for gradually changing the bias potential on said control grid for conditioning said coupling tube circuit to transfer image signal impulses from said mosaic to said transmission channel prior to the initiation into operation of said start stop circuit of said transmitter distributor and operative in another position for actuating said switch for controlling said transmitter distributor for operating said printing telegraph receiver subsequent to the conditioning of said transmission channel.

6. A printing telegraph transmission system comprising a printing telegraph receiver for reproducing telegraphic messages on a transparent web, a light sensitive mosaic arranged in an optical path adjacent the light transparent web, a light beam focused through said transparent web in said optical path upon said light sensitive mosaic for reproducing images of the telegraphic messages from said transparent web upon said light sensitive mosaic, a transmitter distributor including a perforated tape telegraphic control means for producing permutation and combination signal impulses for operating said printing telegraph receiver, a start stop circuit for initiating and halting the operation of said control means including a contactor, a transmission channel, a coupling tube circuit including an electron tube having at least a cathode, a control grid and an anode, an input circuit interconnecting said mosaic said control grid and cathode, an output circuit interconnecting said transmission channel said anode and cathode, means operative in one position for normally biasing said control grid for blocking said coupling tube circuit against transfer of image signal impulses from said mosaic to said transmission channel and operative in another position for gradually decreasing said blocking bias on said control grid for conditioning said transmission channel prior to the initiation into operation of said start stop circuit of said transmitter distributor and operative in a further position for actuating said contactor for controlling said transmitter distributor for operating said printing telegraph receiver subsequent to the conditioning of said transmission channel.

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