

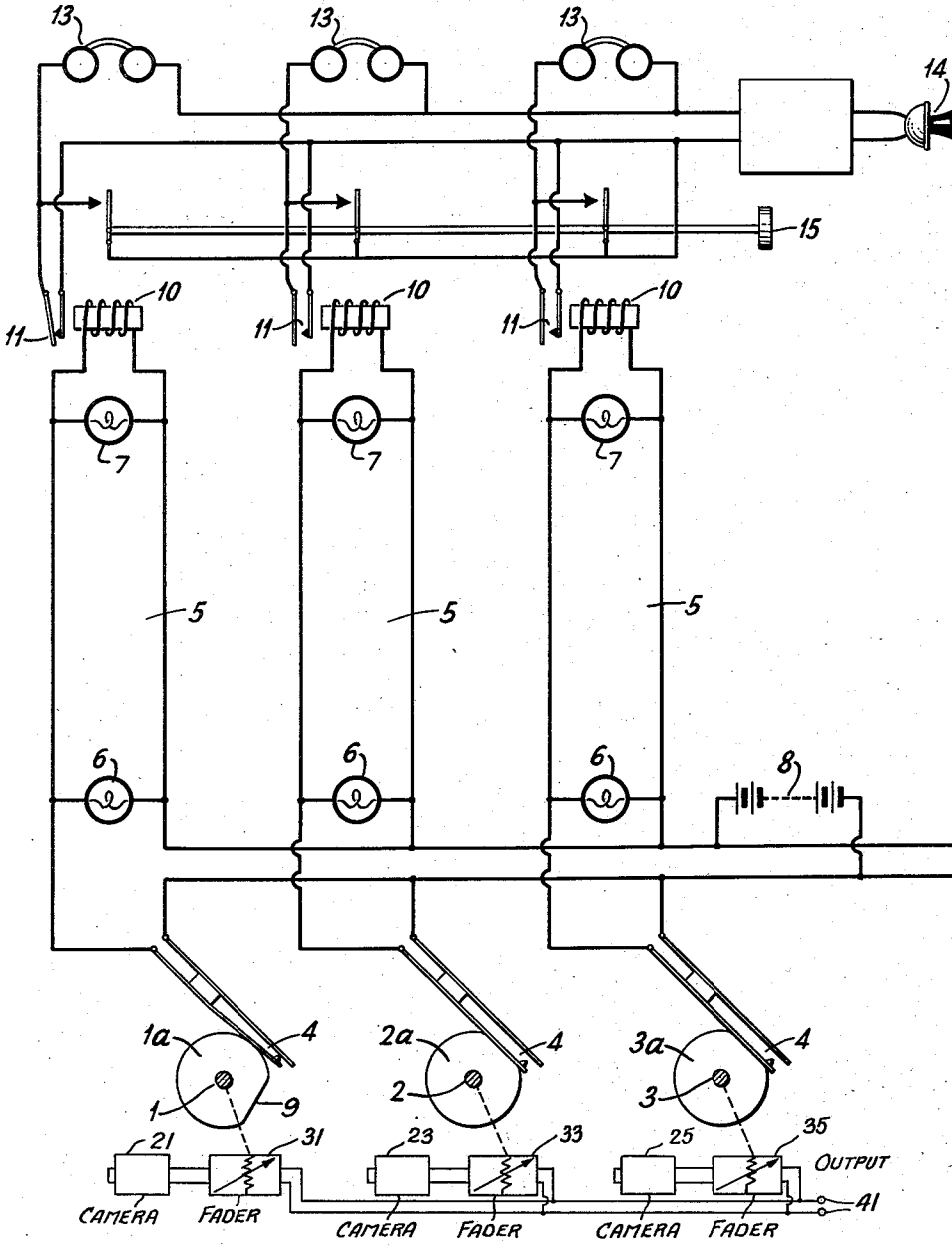
**Feb. 3, 1942.**

C. O. BROWNE

**2,272,043**

## SIGNALING SYSTEM

Filed March 30, 1940



INVENTOR.  
CECIL OSWALD BROWNE

***BY***

**ATTORNEY.**

## UNITED STATES PATENT OFFICE

2,272,043

## SIGNALING SYSTEM

Cecil Oswald Browne, West Acton, London, England, assignor to Electric & Musical Industries Limited, Hayes, Middlesex, England, a company of Great Britain

Application March 30, 1940, Serial No. 326,876  
In Great Britain March 16, 1939

3 Claims. (Cl. 178-7.1)

The present invention relates to television systems and more particularly to television systems in which a plurality of cameras are arranged to feed picture signals to a common picture channel.

In the production of television programmes, it is usual to employ a number of television cameras each viewing a different portion of the "set" which is to be televised and to feed picture signals from different cameras into a common picture channel under the control of the producer, so that a variety of close-up and long shots from different angles may be presented to the viewer. When more than one "set" is in use, a considerable number of cameras may be involved, and additional cameras may also be required to provide background shots or even film sequences.

The producer is usually provided with a control unit having control means, such as potentiometer, which enables him to control the amplitude of the picture signals fed by each camera into the common picture channel from zero to maximum value. In addition, the producer is usually provided with a microphone and a series of switches which enable him to speak to the camera operators either individually or collectively in order to issue instructions in regard to the dispositions of the cameras. Thus, in case of a system having six cameras, the producer is usually provided with a control unit having six control means, or faders, one for each camera channel and six keys for switching his microphone into circuit with each of the camera operators, together with an additional so called omnibus key for switching his microphone into circuit with all the camera operators simultaneously. The producer thus has to select a particular key in order to put himself in communication with the operator of the camera, the signals from which he is about to feed into the common channel, and as he has at such times to control the output from one or more common channels it is a matter of difficulty for him also to select the appropriate key, with the result that in practice the omnibus key is usually employed instead, and the producer is constantly in communication with the operators of all the cameras. The use of the omnibus key in this manner has two disadvantages. Firstly, each camera operator is compelled to listen to the instructions intended for each of the camera operators, and as a result the operators are liable to become less alert and to fail to act upon the producer's instructions promptly when their cameras are feeding signals to the camera picture channel. Secondly, the producer has to couple his instructions with

the name of the particular operator for whom they are intended.

It is the object of the present invention to eliminate the necessity for the actuation of a selected key in order to put the producer in communication with the operator of the camera which is feeding, or is about to feed, picture signals to a common picture channel and so to overcome the above mentioned disadvantages.

According to the present invention, there is provided a television system comprising a plurality of television cameras, a control unit for said cameras said control unit having separate control means for controlling the picture signals fed by each of said cameras to a common channel and further means so associated with each of said control means that on adjustment of one of said control means to a predetermined position, said further means is also actuated so as to place the operator of said control unit in communication with the operator of the camera associated with said adjusted control means.

Preferably, said control means is a fader switch and said predetermined position is any position in which said one of said cameras is arranged to feed its picture channels to said common channel. Said communication may be effected by placing a microphone at said control unit in circuit with a telephone at said camera. If desired, said control unit may be provided with an initial range of adjustment preceding the range of adjustment which controls said picture signals, and when adjusted within the said initial range connects said microphone, or a source of warning signals, to said telephone.

By way of example one form of the invention will now be described with reference to the accompanying drawing which shows a general schematic circuit arrangement, and a few mechanical details of this example of the invention. In the drawing 1, 2 and 3 are the spindles of three fader switches 31, 33 and 35 each of which controls the transmission picture signals from its associated television cameras 21, 23 and 25 to a common picture channel 41. Cams 1a, 2a and 3a are fixed to the spindles 1, 2 and 3 respectively, and are arranged to actuate associated switches 4. It will be observed that each of the cams 1a, 2a and 3a has a circular contour with a flat portion 9 such that the switches 4 are open when said flat portion 9 is in contact with one of the switch arms (see the switches associated with cams 2a and 3a), but are closed when their associated spindles 1, 2 and 3 are rotated so as to move said flat portion away from said

switch arm (see the switch associated with the cam 1a). The angular position of said cams 1a, 2a and 3a upon the spindles 1, 2 and 3 is so arranged that when said flat portions are in contact with said switch arms and said switches are open, each of said fader switches is adjusted so that no output is fed from the camera associated therewith to the common output channel, but when any one of said fader switches is rotated so as to cause its associated camera to feed signals to said common channel, the switch associated therewith is closed.

Each of the switches 4 is connected in a circuit comprising the battery 8 and one of the relay windings 10 which controls a switch 11 serving to connect one of the camera telephones 13 to the output from the microphone 14 on the control unit. When any one of the fader switches is adjusted so as to cause its associated camera to feed signals to the common output channel, the switch 4 associated therewith is closed, the corresponding relay winding 10 energized by the battery 8 and the telephone 13 of said camera connected to the output from the microphone 14, so that the operator at the control unit is automatically placed in communication with the operator of said camera.

The switches 4 may also be arranged as shown in the drawing to light cue lamps 6, 7 on the control unit and the camera respectively to give a visible indication to the operator at the control unit and the operator at said camera that said camera is feeding signals to said common channel.

A so-called omnibus key 15 may also be provided on the control unit to enable the operator to get into communication with all the camera operators simultaneously, when said key 15 is depressed, it mechanically operates switches which connect all the telephones 13 to the output of the microphone 14 as will be seen from the drawing.

It may also be desirable for the operator of the control unit to get into communication with the operator of a camera before signals from said camera are fed into said common channel so that said operator may be warned that his camera is about to be connected with said channel. This may be done by allowing said spindles 1, 2 and 3 a small initial range of adjustment within which their associated fader switches are not adjusted, so that any one of said spindles may be first rotated through a small angle to operate the switch 4 and thus to put the operator of the control unit in communication with the operator of the camera associated therewith before signals from said camera are fed into the common channel.

If it is not necessary to give verbal instructions to the camera operator, a warning signal will be sufficient and in this case the arrangement which has been described above with reference to the drawing may be retained and additional circuits provided to feed a warning signal, such as an audio frequency alternating current, to the telephones 13 on any camera which is about to be put into operation. The additional circuit may comprise a source of audio frequency alternating current arranged to be connected to the telephones 13 by further switches similar to the switches 4, an additional cam being provided on each of the spindles 1, 2 and 3 and arranged to close said further switches momentarily during the initial range of adjustment of

the spindles preceding the adjustment of the associated fader switches.

Alternatively, a push button or like switch may be associated with each of the fader switch controls and arranged so that when it is actuated by the operator it sounds the warning signal in the telephones associated with the corresponding camera.

Although the invention has been described with reference to three cameras, it will be appreciated that it may be used with any number of cameras, some of which may be set up to view "sets," others to view still pictures and others to view film sequences.

It is also to be understood that although the invention has been stated to relate to a television system, it is not limited to television systems in which the picture signals from the camera are fed to a common channel and are transmitted either by a cable or radio link to a cathode ray tube or other reproducer to reproduce the scenes viewed by said cameras, but also includes television systems in which said signals are recorded upon a record such, for example, as a motion picture film, which may subsequently be used to reproduce said scenes.

I claim:

1. A signaling system comprising a plurality of television cameras, each of said cameras having a video output circuit, a common television channel, a central control unit for said cameras, said unit including means for selectively connecting one of said output circuits to said channel, a separate instruction signaling channel connected from said control unit to each of said cameras for carrying information from said control unit to said cameras, and switching means actuated by said selective connecting means for energizing the signaling channel associated with the selected output circuit.

2. A signaling system comprising a plurality of television cameras, each of said cameras having a video output circuit, a common television channel, a central control unit for said cameras, said unit including means for selectively connecting one of said output circuits to said channel, a separate instruction signaling channel connected from said control unit to each of said cameras for carrying information from said control unit to said cameras, switching means actuated by said selective connecting means for energizing the signaling channel associated with the selected output circuit, and independent switching means for energizing all of said signaling channels simultaneously.

3. A signaling system comprising a plurality of television cameras, each of said cameras having a video output circuit, a common television channel, a central control unit for said cameras, said unit including means for selectively connecting one of said output circuits to said channel, a separate instruction signaling channel connected from said control unit to each of said cameras for carrying information from said control unit to said cameras, switching means actuated by said selective connecting means for energizing the signaling channel associated with the selected output circuit, independent switching means for energizing all of said signaling channels simultaneously, and means at each of said cameras and said central control unit actuated by said selecting means to provide an indication of the selected camera and selected signaling channel.

CECIL OSWALD BROWNE.