

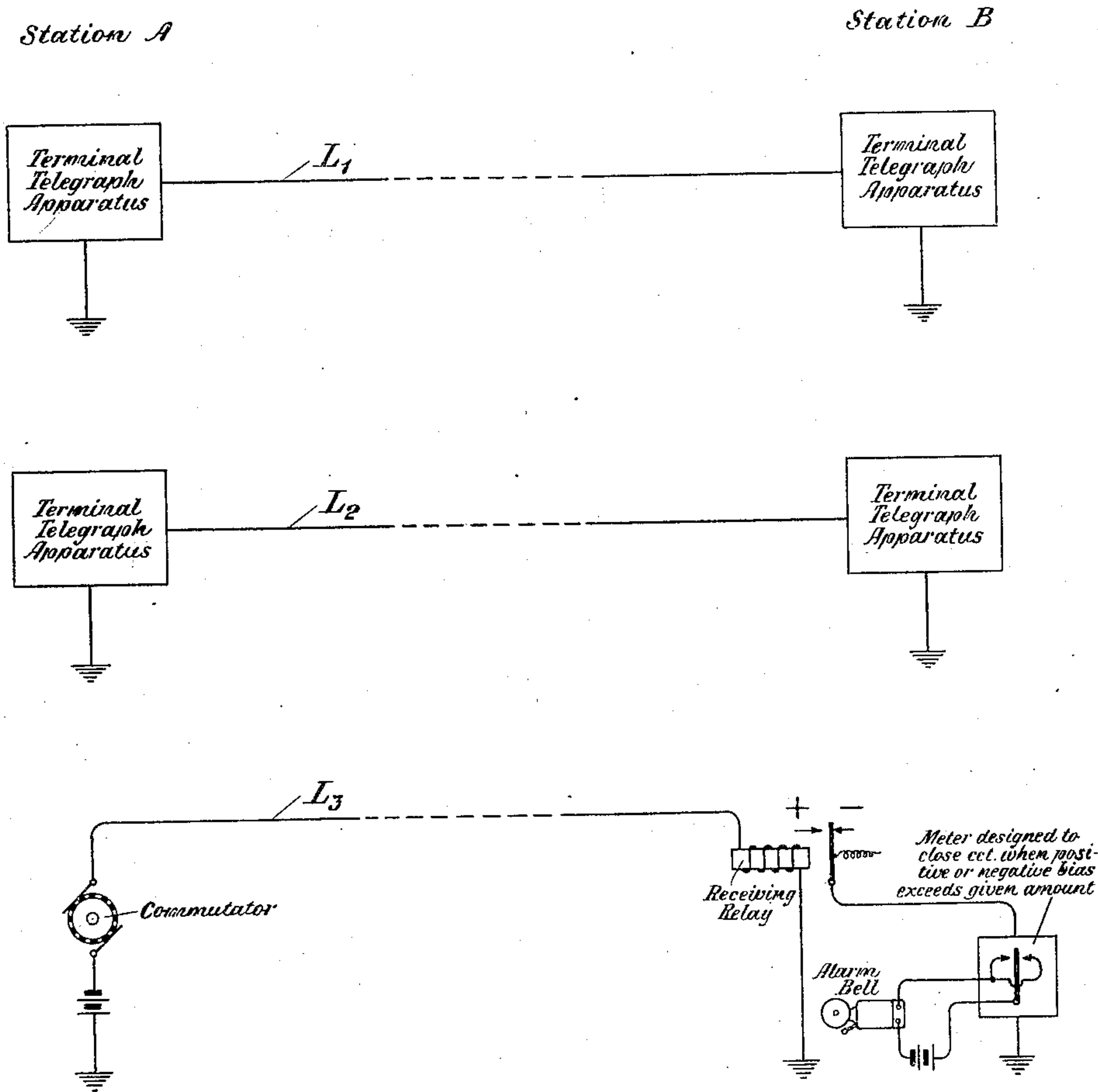
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TROUBLE ALARM FOR TELEGRAPH SYSTEMS

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TROUBLE ALARM FOR TELEGRAPH SYSTEMS.

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My invention relates to carrier telegraph systems, and more particularly to arrangements for automatically producing an alarm when the circuits of a system become seriously unstable.

Among the various forms of trouble found in telegraph circuits used for printer service is bias in the received signals, that is, the durational excess of the marking impulses over the spacing impulses or vice versa. In voice frequency and high frequency carrier telegraph systems it has been found that the bias of all the channels of a system is affected in a similar manner by such troubles as improper repeater gain.

It is the object of my invention to furnish automatic arrangements for producing an alarm to indicate to an attendant that the bias of the channels of a carrier system is seriously great. Means for producing such an alarm are especially valuable in connection with the maintenance of satisfactory service on long carrier circuits during the night period, since when the bias exceeds a given amount, the circuits affected must be withdrawn from service for re-adjustment.

The method and means of my invention will be clearly understood when the following description is read with reference to the accompanying drawing, showing diagrammatically, and in part schematically, three telegraph circuits forming a carrier system, one of the circuits being arranged for use in producing the desired trouble alarm.

Three telegraph circuits are shown connecting station A and station B. The upper two circuits, including lines L_1 and L_2 , respectively, are designed for telegraph service and represent any number of service circuits making up a system. The terminal telegraph apparatus at the ends of each of these circuits is well understood in the art and accordingly is indicated schematically.

The third circuit shown, including the line L_3 , serves as a pilot circuit and may be either a channel which is specially set aside for the purpose or a regular telegraph channel used for this purpose during the periods of light traffic, for instance at night.

At station A I provide a commutator or other source of telegraph reversals, serving to transmit a regular succession of uniform dots and spaces at the same signal frequency that is used in service. A battery is connect-

ed between the commutator and the ground. The circuit is first "lined up" or adjusted so that there is no bias in the received signals. I then connect the source of reversals at station A and continue the transmission of the telegraph reversals over an extended period of time.

At station B a receiving relay is actuated in response to the making and breaking of the circuit at station A, and connects positive and negative battery alternately to the local circuit shown. This circuit includes a device arranged to follow to some extent the individual received impulses and to produce an integrated indication of either positive or negative bias. A suitable device for this purpose is a meter (which may be a recording voltmeter or a recording milliammeter) which is so adjusted that it tends to produce an averaged reading of the amount by which the positive impulses exceed in duration the spacing impulses or vice versa. Associated with this meter is an alarm circuit including a bell or other suitable annunciator and a battery. Contacts are so positioned that when the bias, either positive or negative, exceeds a predetermined amount, the indicating arm of the meter will close the circuit through the alarm bell and the battery. The result, of course, is the sounding of an alarm through the operation of the bell—and the calling of an attendant.

It will be understood that not only excessive bias but also any serious fortuitous distortion affecting the pilot circuit will cause the meter to actuate the alarm annunciator.

Since, as stated above, the other circuits of the system, for instance, with reference to the drawing, those including the lines L_1 and L_2 , are affected similarly to the special or pilot circuit, the alarm given in connection with the one circuit serves to indicate the serious instability of the carrier system.

It is to be understood that my invention as claimed below is applicable to many kinds of telegraph systems in addition to the simple system shown in the drawing for the purpose of illustration.

What is claimed is:

1. In a telegraph system including a plurality of transmission circuits, the method of causing an automatic announcement of the instability of the circuits, which consists in transmitting reversals over one circuit of

the system continuously, causing the received signals to set up alternate positive and negative impulses, and causing an alarm to be given in response to either positive or negative bias in said impulses in excess of a predetermined amount.

2. In a telegraph system including a plurality of transmission circuits, means at one end of one circuit for continuously and regularly making and breaking the circuit, means at the other end of the circuit for producing positive and negative impulses in response to said making and breaking of the circuit, and means associated therewith for causing an alarm to be given in response to a bias in said impulses in excess of a predetermined amount.

3. A telegraph system including a plurality of transmission circuits and a pilot circuit, said pilot circuit comprising means at one end thereof for continuously and regularly making and breaking the circuit,

means at the other end thereof for producing positive and negative impulses in response to said making and breaking of the circuit, and means associated therewith for causing an alarm to be given in response to a bias in said impulses in excess of a predetermined amount.

4. In a telegraph system, a circuit comprising at one end thereof a battery and means for continuously and regularly making and breaking the circuit, and at the other end thereof means for producing positive and negative current impulses in response to the making and breaking of the circuit, an alarm annunciator, and means for operating said annunciator in response to a bias in said positive and negative impulses in excess of a predetermined amount.

In testimony whereof, I have signed my name to this specification this 8th day of July, 1926.

MACLEAN KIRKWOOD.