

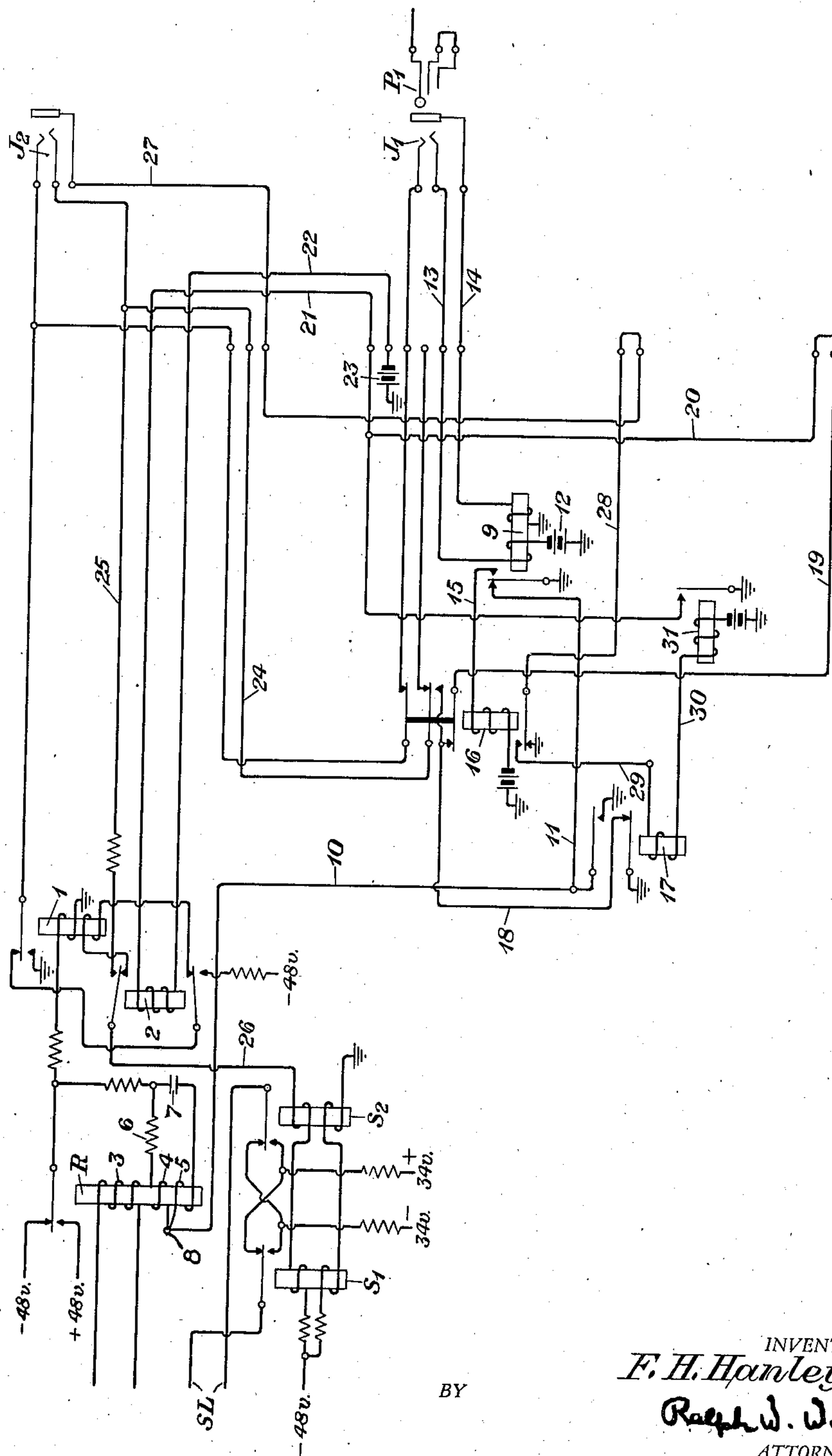
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TELEGRAPH SYSTEM

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TELEGRAPH SYSTEM

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This invention relates to telegraph systems and more particularly to improvements in telegraph repeater sets utilized in such systems.

In telegraph repeaters of certain types it is the practice to provide the receiving relay with what is termed a vibrating circuit. This type of circuit is well known in the art and includes auxiliary windings on the relay in addition to the usual line winding. The purpose of such a vibrating circuit is to cause acceleration of the relay armature and thereby cause the relay to operate more efficiently. If the line circuit of the repeater is opened or disconnected, which is usually the case if the repeater is released or in a spare condition, the vibrating circuit unless also opened or disabled would take control and cause the relay to vibrate continuously. Such vibration would be very undesirable as it would cause rapid deterioration of the relay contacts. Consequently when the repeater is released means must be provided for disabling the vibrating circuit of the receiving relay. Heretofore this usually has been done manually by the service board attendant in various ways such, for example, as by removing the battery or the receiving relay from the repeater. Such additional operations by the service board attendant are undesirable in that they are time consuming and may be delayed or overlooked with resulting trouble in the relay. The arrangements of the invention provide means whereby the normal operation of the leg multiple relay unit individual to the repeater in question will automatically close the vibrating circuit when the repeater set is assigned or seized for use and will disable the vibrating circuit when the set is unassigned or released. Other objects and features of the invention will appear more fully from the detailed description thereof hereinafter given.

The invention may be more fully understood from the following description together with the accompanying drawing in the figure of which is shown a circuit diagram illustrating a preferred embodiment of the invention.

In the upper left-hand portion of the drawing is shown a type of metallic telegraph repeater set well known in the art. This set comprises a receiving relay R and two sending relays S₁ and S₂. It would also include an auxiliary relay I and a relay 2 for changing the repeater from full duplex operation to half duplex operation. The receiving relay R would have a line winding 3 and two auxiliary windings 4 and 5. These auxiliary windings 4 and 5 and resistance 6 and condenser 7 would in prior arrangements be connected from

a ground (not shown) connected to the point 8 over the armature and contacts of the relay R to positive and negative sources of voltage. These two auxiliary windings 4 and 5 constitute what is termed in the art a vibrating circuit. If no current existed in the line winding 3 of the relay R the vibrating circuit would cause the armature of the relay to move continuously back and forth between its contacts. When the relay is being used the current in the line winding 3 controls the operation of the relay and it has been found that the use of the vibrating circuit will result in improved operation of the relay by causing acceleration of the relay armature operation. Under certain conditions no current will flow in the winding 3 of the receiving relay. This is usually the case when the telegraph repeater is unassigned or released from service because under such conditions it is not the practice to keep a line connected to the repeater. Accordingly, unless the vibrating circuit is also disabled the relay would vibrate continuously and this would cause rapid deterioration of its contacts. Heretofore when ground at 8 was connected to the vibrating circuit its disabling was accomplished manually by the repeater attendant either by removing the batteries or by removing the receiving relays or in various other ways. In the arrangements of the invention the vibrating circuit is disabled automatically at the proper time by the leg multiple relay unit shown in the lower right-hand portion of the drawing. The leg multiple relay unit is an arrangement well known in the art, and a unit is provided individual to each repeater. A leg multiple relay unit is described in U. S. Patent 2,349,586, dated May 23, 1944, to A. R. Bonorden et al, and is illustrated in Fig. 3 of said patent. The functions of the leg multiple relay unit are to enable the repeater to be temporarily released or disconnected from a hub circuit and when so released to be seized and associated by a patch with another hub circuit. Only so much of the leg multiple relay unit as is necessary for an understanding of the arrangements of the invention has been illustrated. Normally when the repeater of this invention is in operation ground will be applied to the vibrating circuit over conductors 10 and 11 and the back contact and armature of a relay 9 in the leg multiple relay unit instead of from ground at 8.

The operation of the invention is as follows: If it is desired to temporarily remove the repeater from service the plug P₁ will be inserted in jack J₁. This will close the following circuit: from ground and battery 12, left-hand winding of

relay 9, conductor 13, ring contacts of jack J₁ and plug P₁, sleeve contacts of Plug P₁ and jack J₁, conductor 14, right-hand winding of relay 9 to ground. This will operate the relay 9. This will close a circuit from ground, armature and right-hand contact of relay 9, conductor 15, winding of relay 16 to battery and ground. This will operate relay 16. The operation of relay 16 will open at its upper left-hand contact the following circuit: from ground, armature and contact of relay 17, conductor 18, upper left-hand contact and armature of relay 16, conductors 19, 20 and 21, winding of relay 2, conductor 22 to battery 23 and ground. The opening of this circuit will release the relay 2. The operation of relay 16 and the release of relay 2 will close the following circuit: from ground, armature and contact of relay 17, conductor 18, right-hand upper contact and armature of relay 16, conductors 24 and 25, upper contact and armature of relay 2, conductor 26, windings of sending relays S₂ and S₁ to a source of 48 volt battery. This will cause the batteries associated with the relays S₁ and S₂ to send a spacing signal out over the sending line SL to indicate to the distant repeater that the repeater under consideration is no longer connected in service. The operation of relay 9 will remove the ground connected to its left-hand armature and thence over conductors 11 and 10 to the vibrating circuit and hence will disable the vibrating circuit. As will be seen, this is done automatically while the leg multiple relay unit is performing one of its normal functions, namely, that of signaling to a distant repeater that the repeater under consideration is removed from service. In order to temporarily remove the repeater from service the leg multiple relay unit will also perform additional functions. However as these are well known in the art and as a description thereof is not necessary for an understanding of this invention no description thereof will be given. Should it now be desired to seize the released repeater for another service a connection would be made with the leg multiple jack J₂. The sleeve of this connection would be grounded and accordingly would complete the following circuit: from the ground connected to the sleeve of jack J₂, conductors 27 and 28, lower contact of relay 16, conductor 29, winding of relay 17, conductor 30, winding of relay 31 to battery and ground. This would operate relay 17. The operation of relay 17 would apply ground from its upper con-

tact and armature to conductor 10 and thus restore the vibrating circuit to an operable condition. Thus it will be seen that when it is desired to seize the repeater for use the leg multiple relay unit in performing one of its normal functions will automatically restore the disabled vibrating circuit so that it will again operate.

While the invention has been disclosed as embodied in certain specific forms which are deemed desirable, it is understood that it is capable of embodiment in many and other widely varied forms without departing from the spirit of the invention as defined by the appended claims.

What is claimed is:

1. A telegraph repeater including a receiving relay, a vibrating circuit for said relay, a leg multiple relay unit associated with said repeater, means in said unit for enabling said repeater to be temporarily disconnected from service, means controlled by the operation of said last mentioned means for disabling said vibrating circuit, means in said unit for enabling said repeater to be connected back into another service, and means controlled by the operation of said last mentioned means for restoring said vibrating circuit into an operable condition.

2. A telegraph repeater including a receiving relay, a vibrating circuit for said relay, a leg multiple relay unit whose functions are to enable the repeater to be temporarily released or disconnected from a hub circuit and when so released to be seized for use with another hub circuit, and means controlled by said leg multiple relay unit in performing said functions for automatically opening said vibrating circuit when said repeater is released and closing said vibrating circuit when said repeater is seized for use.

3. A telegraph repeater including a receiving relay, a vibrating circuit for said relay, a leg multiple relay unit associated with said repeater, relay means in said unit operated when said unit functions to release or disconnect said repeater from a hub circuit, means for completing said vibrating circuit over a contact of said relay means when said relay means is unoperated, a second relay means in said unit operated when said unit functions to seize said repeater for use with another hub circuit, and means for completing said vibrating circuit over a contact of said second relay means when said second relay is operated.

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