

with the locking out train upon the initial movement of its corresponding operating lever, to thereafter permit continued vibration of said operating lever, substantially as described. 7th. In a repeater, a series of operating levers, a locking out train, an independent locking device for each operating lever, each locking device having engaging portions adapted to co-operate with said locking out train and with its corresponding operating lever, to be moved by said locking out train into position to mechanically lock said operating levers, any one of which locking devices being movable automatically out of co-operative engagement with said locking out train upon the operation of its corresponding operating lever, to thereby permit free vibration of said lever, substantially as described. 8th. In a repeater, a series of circuit controllers, a repeating train for operating them, a locking lever for said train, a series of operating levers, one for each circuit connected with the repeater, movement of any one of which will operate said locking lever to release the train, a locking out train, an independent pivoted locking device for each operating lever, one end of which is normally engaged and held by the operating lever, and the other end of which has portions o^2 , o^{21} , adapted and arranged to co-operate with the locking out train, the portion o^2 being acted upon by said train when its opposite end is engaged by the operating lever, and the portion o^{21} being acted upon by said train when said locking device is released, substantially as described. 9th. In a repeater, a series of circuit controllers, a repeating train for operating them, a locking lever for said train, a series of operating levers for said locking lever connected respectively with the armature of the operating electro-magnets, a locking out train having as a co-operative part of it a rotatable projection, as i^{20} , a series of pivoted controlling levers having bent fingers o^2 normally held in the path of movement of the projection i^{20} by the operating levers, but removed therefrom when released, and also having fingers o^3 , substantially as described. 14th. In a repeater, an operating lever for each circuit connected with the repeater, responsive to changes in the conditions thereof, an independently movable locking device for each operating lever, a motor for moving said locking devices to lock the operating levers, each locking device being normally held by its corresponding operating lever in a position to be thus operated upon the starting of said motor to lock its operating lever, but adapted to move automatically when released by its operating lever to a position in which it is not operated upon the starting of said motor, said locking devices each having a portion adapted to be engaged by said motor to move said locking device into its locking position, means for causing said motor to start at the first impulse of the signal and to stop at the completion of the signal, substantially as described. 11th. A repeater having a number of independent operating levers, one for each circuit connected therewith and responsive to changes therein, and each adapted by its movement from its normal position to control the operation of the instrument, an electro-magnet and armature for each circuit, said operating levers being connected with said armatures held by them in normal position, a spring for each operating lever operating when unopposed to move said operating levers to abnormal position, an independent locking device for each operating lever, and means for moving all of said locking devices to their locking positions at each complete operation of the repeater, any or all of said locking devices being held in such locking position by said operating levers to thereby hold said operating levers until said levers are otherwise held, substantially as described. 12th. In a repeater, an operating lever for each circuit connected therewith, an independently movable locking device for each, a locking out train with which all of said locking devices co-operate, said locking devices having portions which are engaged by said locking out train at the final movement thereof, whereby all of said locking devices are carried to a position in which they lock their respective operating levers and remain in such locking position unaffected by subsequent operations of the repeater, and means for retaining said locking devices in such position dependent upon the condition of their respective circuits, substantially as described. 13th. In a repeater, an operating lever for each circuit connected therewith and responsive to changes therein, a repeating train, a locking out train controlled by said repeating train, a pivoted locking device for each operating lever weighted at one side of its pivot, engaging portions at one end thereof, one of which is engaged by the operating lever in its normal position and the other when said operating lever is moved in response to a change in its circuit, allowing said locking device to rock on its pivot, and engaging portions at the opposite end of said locking device adapted to be engaged by the said locking out train, the co-operation of said train with said engaging portions being dependent upon the position of said locking devices determined by their relation to said operating levers, substantially as described. 14th. In a repeater, a series of circuit controllers, a repeating train for operating them, a locking lever for said train, a series of operating levers arranged adjacent to said locking lever, a series of electro-magnets and armatures therefor, and connecting rods connecting said armatures with the operating levers, substantially as described. 15th. In a repeater, a series of circuit controllers, a repeating train for operating them, a locking lever for said train having a horizontal cross piece, a series of vertical operating levers arranged side by side adjacent to said cross piece, a series of electro-magnets and armatures therefor, and connecting rods connecting said armatures respectively with the operating levers, substantially as described. 16th. In a repeater, a

series of circuit controllers, a repeating train for operating them, a locking lever for said train, a series of operating levers arranged adjacent to said locking lever, a series of electro-magnets and armatures therefor, extensions on said armatures, and connecting rods connected at one end with said operating levers and at the other end with the extensions on said armatures, substantially as described. 17th. In a repeater, a series of circuit controllers, one for each circuit, adapted to be opened and closed at each operation of the repeating train, a series of controlling levers governing the operative positions of said circuit controllers, and a series of operating levers any one of which releases the repeating train for each impulse, substantially as described. 18th. In a repeater, a repeating train, a locking lever therefor, a series of circuit controllers, one for each circuit, adapted to be opened and closed at each operation of the repeating train, a series of operating levers movement of any one of which will operate said locking lever and release the repeating train, an independent locking device for each operating lever, and a locking out train for moving said locking devices to mechanically hold the operating levers and retain them while the repeating train operates the circuit controllers, said locking devices having portions adapted to engage the circuit controllers and place them in position to be operated by the repeating train when moved to lock the operating levers, substantially as described. 19th. In a repeater, a repeating train, a locking lever therefor, a series of operating levers, one for each circuit, connected with the repeater, responsive to changes therein, movement of any one of which will release said train, a series of circuit controllers, one for each circuit, adapted to be opened and closed at each operation of the repeating train, and an independent locking device for each operating lever having a portion adapted to engage one of the circuit controllers, and a locking out train for moving said locking devices into position to mechanically hold the operating levers and to open the circuit controllers, substantially as described. 20th. In a repeater, a repeating train, a locking lever therefor, a series of operating levers, one for each circuit, connected with the repeater, responsive to changes therein, movement of any one of which will release said train, a series of circuit controllers, one for each circuit, adapted to be opened and closed at each operation of the repeating train, and an independent locking device for each operating lever having a portion adapted to engage one of the circuit controllers, and a locking out train for moving said locking devices into position to mechanically hold the operating levers and to retain them in such position until the end of a signal, and to engage and raise one of the contacts of the circuit controllers and retain it in elevated position until the end of a signal, substantially as described. 21st. In a repeater, a repeating train, locking lever therefor, and a series of operating levers, one for each circuit connected with the repeater, movement of any one of which will operate said locking lever, independently movable locking devices, one for each operating lever, a repeating circuit controller for each circuit, a portion of each locking device adapted when said locking device is in locking position to engage one member of one of the circuit controllers and thus open the circuit, and a locking out train for moving said locking devices into locking position and retaining them there until the close of the message, substantially as described. 22nd. In a repeater, a repeating train, a locking lever therefor, and a series of operating levers, movement of any one of which will operate said locking lever, independently movable locking devices, one for each operating lever, consisting of pivoted levers normally held by said operating levers in a position to be engaged by a cam operated by a locking out train, a projection on said lever adapted when the lever is engaged and moved by said cam to engage and hold the said operating lever, and a portion of said lever adapted to engage one member of a circuit closer at the repeater and thus open the circuit belonging to the said lever through the repeater, substantially as described. 23rd. In a repeater, a series of normally closed circuit controllers, one for each circuit connected therewith, a series of operating levers, a series of controlling levers governed by said operating levers, which when operated open all of said circuit controllers except the one connected with the operating circuit, and hold them open until the end of a signal, and also mechanically hold the corresponding operating levers, and a repeating train responsive to the operating circuit for successively closing the circuit controllers thus opened, and means for closing said circuit controllers a predetermined time after the repeating train has ceased to operate, and in case of a broken circuit to also mechanically hold the operating lever of said circuit, substantially as described. 24th. In a repeater, a series of circuit controllers, one for each circuit adapted to be opened and closed at each operation of the repeating train, and a series of controlling levers governing the operative positions of said circuit controllers, a locking out train with which said controlling levers co-operate, a series of operating levers governed by electro magnets in the circuits, any one of which releases the repeating train for each impulse, substantially as described. 25th. In a repeater, a series of normally closed circuit controllers, one for each circuit connected therewith, a series of controlling levers for said circuit controllers which when operated engage one member of and separate it from the other member of the said circuit controller and thereby open all of said circuit controllers except the one connected with the operating circuit, means for thus operating the controlling levers, and for holding them open until the end of the signal, and a repeating train responsive to the operating circuit for successively and materially closing the circuit controllers thus opened, sub-