

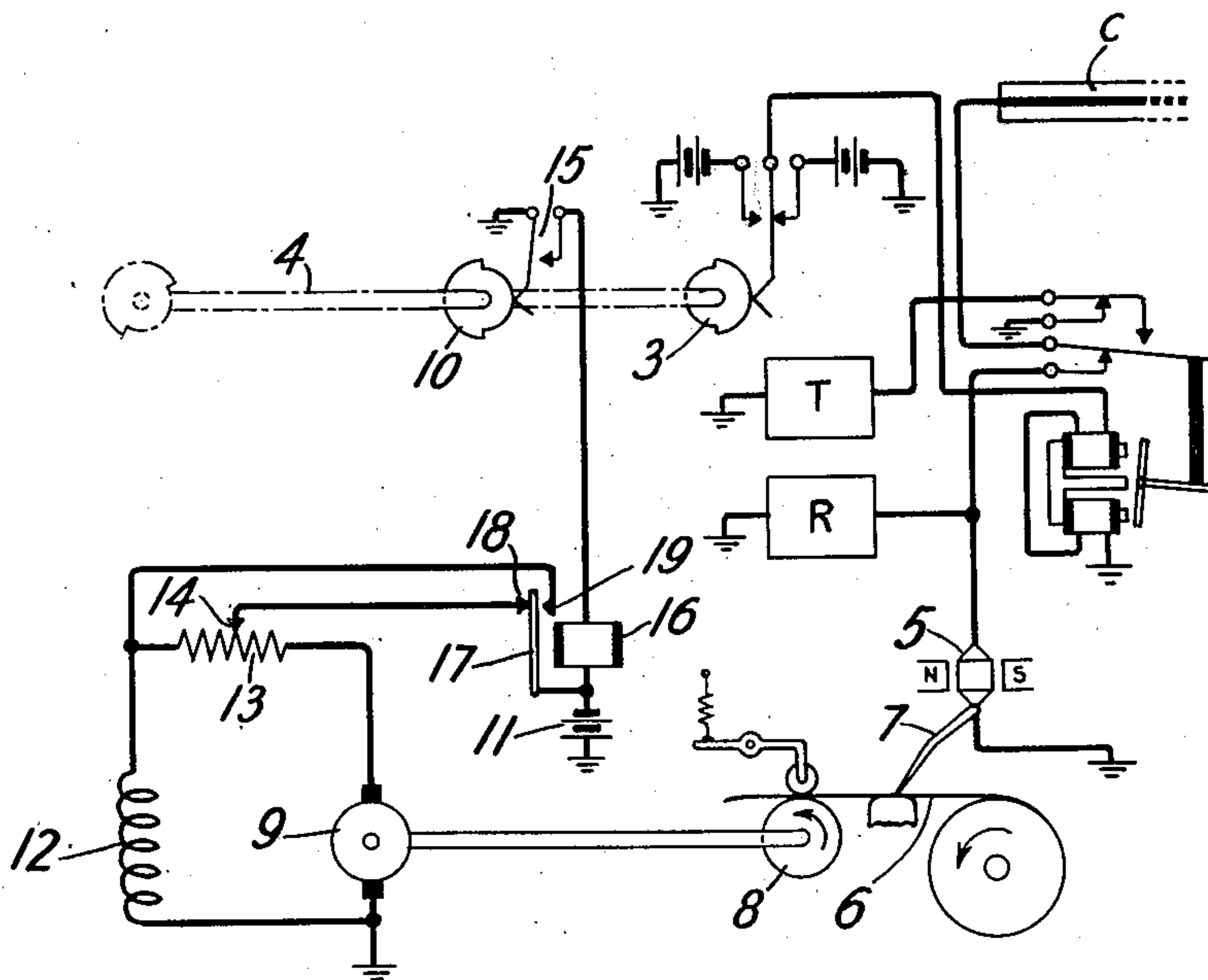
April 12, 1927.

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TELEGRAPH SYSTEM

Filed May 29, 1926

1,624,393



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Patented Apr. 12, 1927.

1,624,393

UNITED STATES PATENT OFFICE.

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TELEGRAPH SYSTEM.

Application filed May 29, 1926. Serial No. 112,464.

This invention relates to telegraph systems and particularly to such systems in which signals are alternately transmitted and received.

5 An object of this invention is to provide an economical and reliable recording system for alternate transmit-receive telegraph systems.

10 Loaded submarine cables are often most advantageously operated simplex, that is, transmitting takes place in only one direction at a time. Therefore, it is necessary to reverse the direction of transmission in order to handle traffic in both directions. 15 This reversal may be carried out either manually or automatically. At the end of one period the transmitting apparatus at one end is cut off and the receiving apparatus connected, while the reverse operation is 20 carried on at the other end. When tape recorders are employed, with such an arrangement, either for recording messages or for monitoring, it is desirable in order to save tape to limit their operation during 25 the period in which the side of the system to which they are connected is not in operation. If the tape pulling motor is stopped entirely, blotting is likely to occur and it is therefore desirable to merely reduce the speed of the tape pulling motor during the 30 period of operation in which the recorder is not used.

35 In multiplex printing cable telegraph systems, such, for example, as high speed, simplex systems arranged to transmit alternately in each direction over long, loaded cables, where siphon recorders are employed for monitoring, either transmitting or receiving, it is particularly desirable to provide an arrangement for automatically reducing the speed of the tape pulling motor when the direction of operation is changed by the switching mechanism. The speed of transmission in systems of the type just referred to is several times as great as in cable telegraph systems heretofore in use and the saving in tape and other maintenance costs by the use of the invention is considerable.

40 According to a feature of this invention there is provided in an alternate transmit-receive telegraph system, an arrangement for slowing down the tape pulling motor of a recorder to a speed at which the ink will still flow normally, but at which considerable tape is saved during the period of op-

eration in which the recorder is not employed.

This invention can be more readily understood by reference to the following detailed description in connection with the drawing 60 which shows diagrammatically one embodiment of the invention in an alternate transmit-receive cable telegraph system.

Referring to this drawing shaft 4 is a portion of the shaft of the local switch of 65 a multiplex printing telegraph system arranged for simplex transmission alternately in each direction. This switch consists of a series of cams which open and close electrical contacts for changing the direction 70 of operation of the system from transmitting to receiving and vice versa. The printing telegraph transmitting apparatus and receiving apparatus are indicated schematically in the drawing at T and R, respectively. The switch cam 3 on the shaft 4 75 serves in one position to operate a polarized relay for connecting the transmitting apparatus to the transmission line or cable C and in another position for connecting the 80 receiving apparatus thereto. It will be understood that the circuit arrangement in the drawing is very much simplified, as for example by the omission of means for amplifying and correcting the incoming signals 85 before applying them to the receiving apparatus or to the monitoring arrangement next to be described.

A siphon recorder 5 is shown which is employed to monitor the operation of the 90 cable during receiving, for example. This recorder makes a record on a tape 6 by means of a pen 7. The tape is drawn by rollers 8 driven by a direct current motor 9. For accurate monitoring the tape is 95 driven at a speed of approximately 60 feet per minute. The speed of the motor is manually controlled to regulate the speed of the tape or to reduce it when the system is operating in such a manner that accurate monitoring is not required. The cam 10 mounted on the shaft of the local switch operates a contact 15 to slow down the motor during the transmitting period, when the recorder is not used. By means of the circuit con- 105 nected to the cam, the speed of the motor is reduced to four or five feet per minute, thus resulting in a considerable saving in tape.

Power is supplied from a battery 11 to 110

the motor 9 which has a shunt field 12 having one terminal connected directly to one brush and the other through a resistance 13 to the other brush. A sliding contactor 14 is provided by means of which the resistance 13 may be divided between the armature and field circuits to control the speed of the motor. When a contactor is in the right hand position the resistance is all in the field circuit and the motor runs at the highest speed while when the contact is in the left hand position, the resistance is all in the armature circuit and the motor runs at the lowest speed. A relay 16 having an armature 17, back contact 18 and front contact 19 is provided for reducing the speed of the motor during the transmitting period. During the receiving period of operation of the system in which the cam 10 is in the position shown, connections are made from the negative pole of the battery 11 through armature 17, back contact 18 to the sliding contactor 14, so that the motor operates normally and its speed can be controlled by moving the contactor along the resistance 13. During the transmitting period, connections are made from the positive pole of the battery 11, ground, contact 15 of cam 10, winding of relay 16 to the negative terminal of the battery actuating the relay 16 to make a connection from the negative pole of the battery, through the armature 17, front contact 19 to the left hand terminal of the resistance 13, slowing the motor down to its lowest speed and disconnecting the sliding contactor 14.

It is understood that the embodiment of the invention above described can be variously modified without departing from the spirit of the invention as defined in the appended claims.

What is claimed is:

1. In a telegraph terminal system arranged to operate in alternate transmitting and receiving periods, a recorder for use during one of said periods, a tape on which a record is made by the operation of the recorder, a tape pulling motor, switching mechanism for controlling the direction of

operation of said system and means controlled by said switching mechanism for reducing the speed of said motor during the other of said periods of operation.

2. A combination according to the preceding claim in which the motor is an electrical motor having a shunt field winding and a resistance normally in series therewith, and the speed reducing means comprises a relay and connections for removing said resistance from the field winding circuit.

3. In an alternate transmit-receive telegraph system, a recorder having a pen for monitoring during one period of operation, a tape on which a record is made by said pen, a motor for pulling the tape through said recorder, a shunt field winding for said motor, a resistance normally connected in series with said field winding, switching mechanism for controlling the direction of operation of said system, and means operated by said switching mechanism for removing said resistance from the field winding circuit during the other period of operation to reduce the speed of said motor.

4. An alternate transmit-receive telegraph system, a recorder having a pen for monitoring during the receiving period, a tape on which a record is made by said pen, a motor for pulling said tape, a shunt field winding for said motor, a resistance connected in series with said winding, a source of current, connections from said source to said motor for supplying current thereto, one of said connections including a variable tap to said resistance whereby the portions of the resistance included in the armature and field circuits of the motor are controlled to regulate the speed of the motor, switching mechanism for controlling the direction of operation of said system, and means for reducing the speed of said motor during the transmitting period, said means comprising a relay having contacts for connecting said resistance in the armature circuit during the transmitting period.

In witness whereof, I hereunto subscribe my name this 27 day of May, A. D. 1926.

ALLISON A. CLOKEY.