

July 26, 1927.

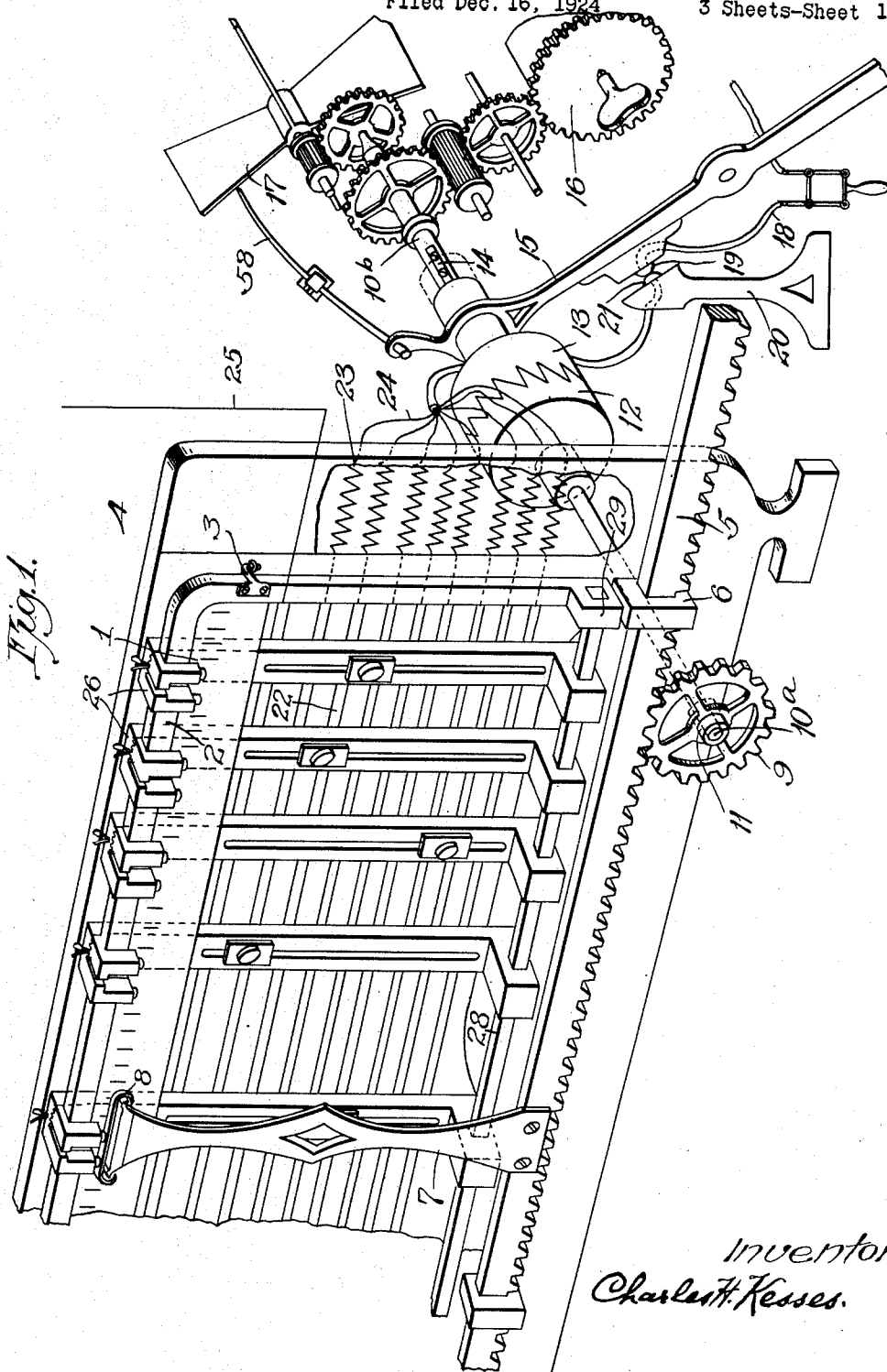
C. H. KESSES

1,637,080

ELECTRIC SIGNAL TRANSMITTER

Filed Dec. 16, 1924

3 Sheets-Sheet 1



Inventor:
Charles H. Kesses.

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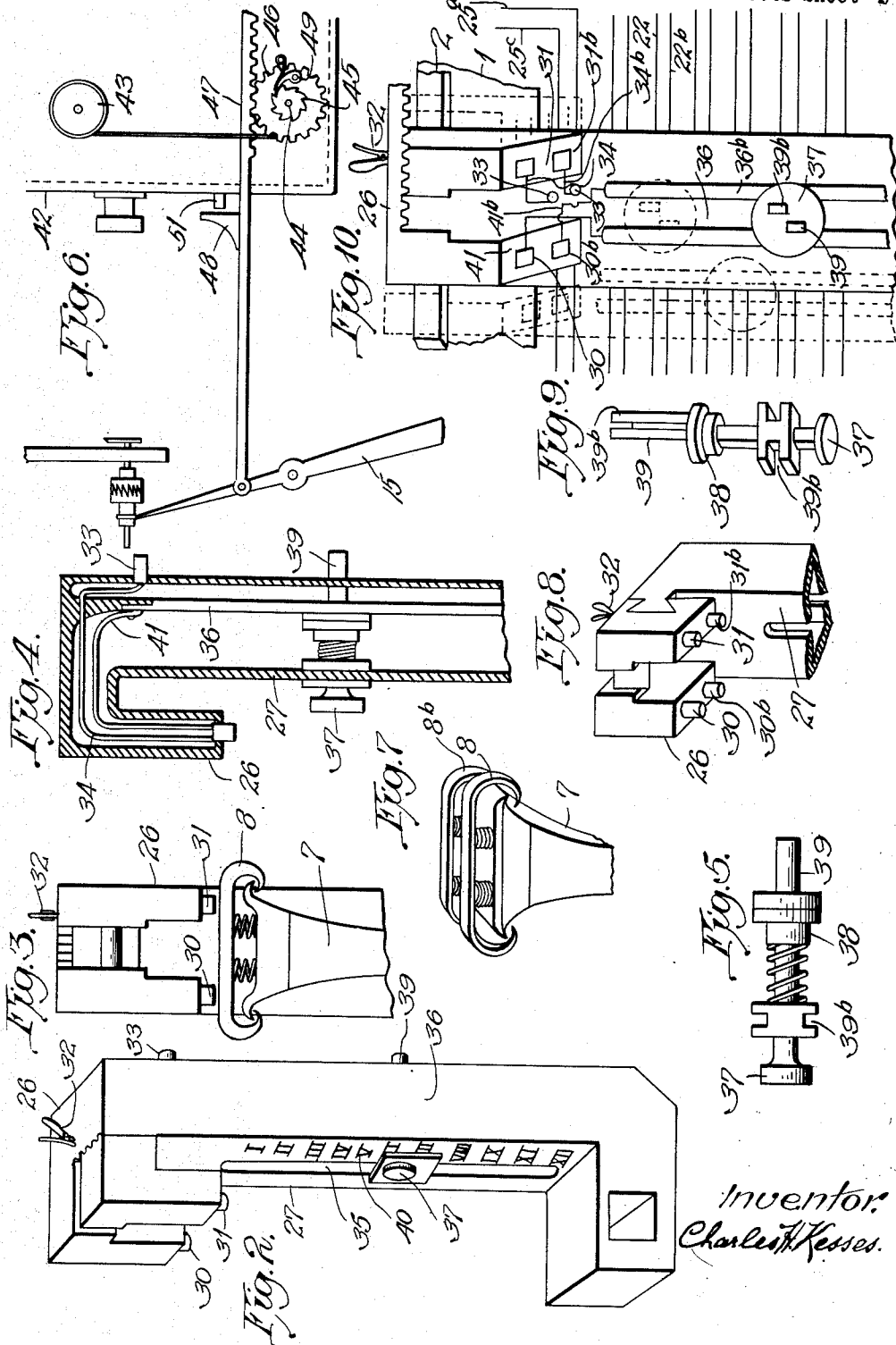
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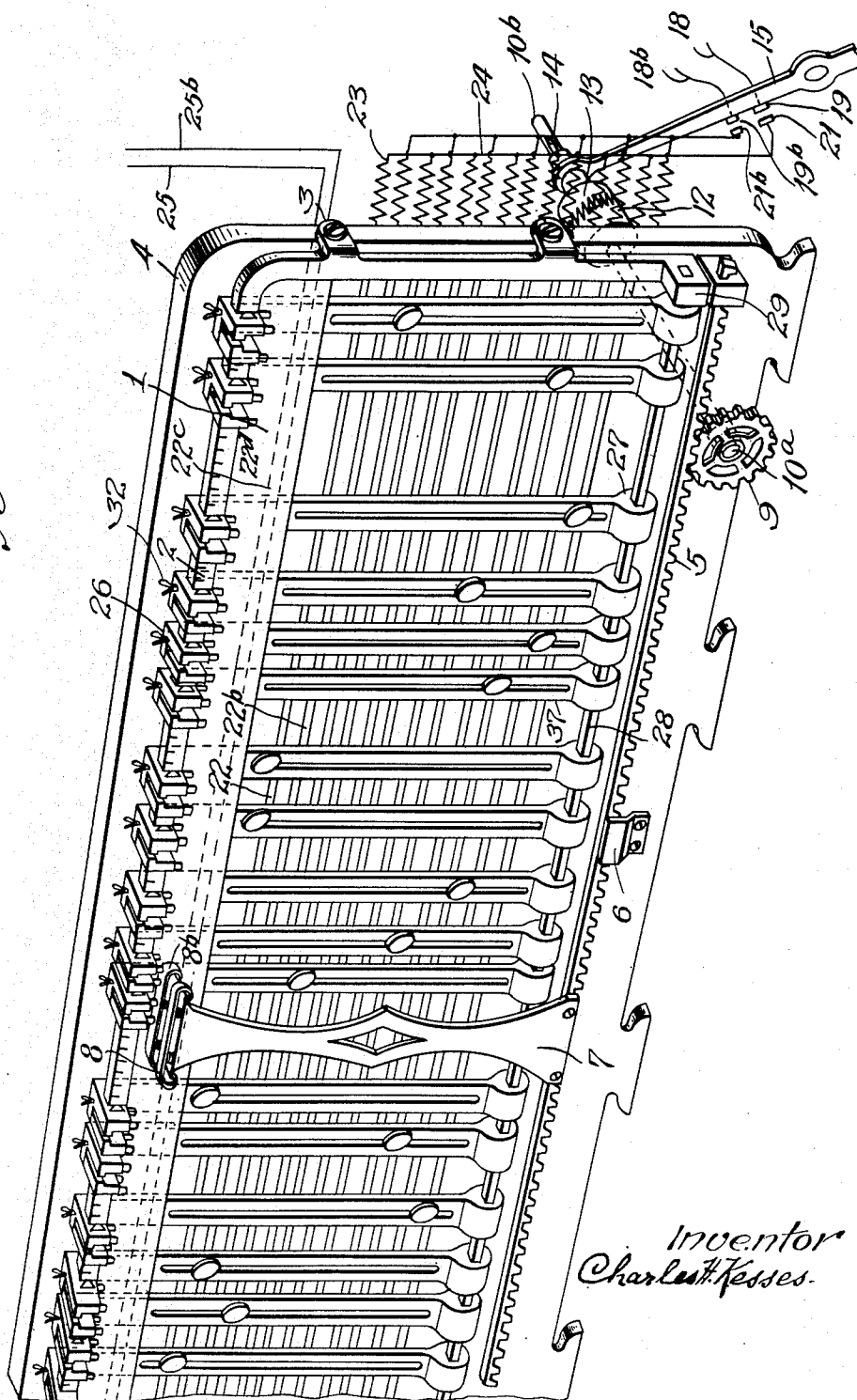
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Fig. 11.



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UNITED STATES PATENT OFFICE.

CHARLES H. KESSES, OF NEW YORK, N. Y.

ELECTRIC SIGNAL TRANSMITTER.

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First, my invention relates to electric signal transmitters, whereby a code of impulses may be transmitted to a telegraph siphon recorder varying in length, strength and spacing.

Second, to have operative means arranged on the operating lever of the transmitter to take with the aid of a camera a picture of the different regulating means of the transmitter, by the starting of said transmitter with said lever for the purpose of automatically registering.

Third, to have a second modification of said transmitter which operates in the same manner as the one in the first modification with the exception that it controls both lines, the negative line and the positive line in one operation.

Fourth, to have means provided to exchange the frame with its switches on said transmitter for the purpose to regulate the switches by one operator and to transmit the message by a second operator.

Fifth, to have three regulating means on each one of said switches, by using only five regulating units of each one of said regulating means it is possible to transmit with electric impulses on each one of said switches one hundred and twenty-five different signs and to produce each one of said different signs with one single electric impulse.

Sixth, to have means provided to close the circuit to said transmitter by the starting of the operation and to open said circuit by the sloping of said transmitter.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Fig. 1 is a perspective view of the device as it appears after the removal of a part of the dial and showing a few of a series of movably arranged switches.

Fig. 2 is a perspective front and right side view of a switch.

Fig. 3 is a front view of an enlarged upper part of a switch and showing a bridging contact which is carried on the upper part of the hand.

Fig. 4 is a view of a section of said switch, showing the conductors carried in said switch.

Fig. 5 is a view of a contact pin which is carried on a spring button arranged for moving in said switch member, to connect

said switch to a different strength of current contact.

Fig. 6 is a view of a camera which is operatively connected to the operator's lever.

Fig. 7 is a view of two bridging contacts which are carried on the moving arm, one of said contacts to operate the positive line and the second one to operate the negative line.

Fig. 8 is a view of the upper part of a switch carrying two sets of contacts, one set for the negative and the second set for the positive current.

Fig. 9 is a view of an adjustably arranged duplex contact pin; one of said pins is arranged for closing the circuit for the positive and said second pin for closing the circuit of the negative current.

Fig. 10 is a view, a section of one of the switches, showing the inside circuit connection, the regulating parts therefor and a second position of said regulating means in a dotted line.

Fig. 11 is a front view of a modification of said signal transmitter which operates in the same manner as the modification shown in Fig. 1, with the exception that the circuit is made and broken in the negative line and in the positive line instead of in one side only as in the first modification.

Similar letters or numbers refer to similar parts throughout the several views.

A dial, 1, is secured to the upper part of a frame, 2. Said frame is with the hooks 3, removably secured to a stand, 4. A gear-rail, 5, is slidably arranged in brackets, 6, which are secured to the frame, 2. An arm, 7, is secured to said gear-rail and carries on its upper part a bridging contact, 8. Suitable springs are arranged between said arm and said contact to give, with said contact perfect circuit connections to the switches. A gear-wheel, 9, is secured to the main-shaft, 10, of the clockwork and is meshed to the gear-rail, 5, to move said rail in suitable brackets which are secured to the frame 2 in a straight path by the operation of the clockwork. Said shaft, 10, is in two parts, part 10^a and part 10^b. Part 10^a is arranged to turn in a hollow member, 11, which is secured in the stand, 4. A clutch member, 12, is secured to the shaft, 10^a and is meshed to a second clutch member, 13, which is slidably arranged on the shaft, 10^b. A rail, 14, is secured to said shaft and is fitted in a

corresponding opening in the clutch, 13, to connect or to disconnect both shafts, as shown by the dotted line position of said clutches. A lever, 15, is secured to the clutch, 13, to move the clutch members together by the operation of said lever.

The clock-work, which operates the electric device is connected to it through the shaft 10^b. In the lower part of said clock-work is a weight or a spring, 16. A chain of gears and pinwheels connect a paddle-wheel, 17, with said spring. The device of a clock train can be changed to any other type of a constant speed driving mechanism. And a wire, 58, is slidably secured in a bracket to the casing of the clock; said wire is secured to the upper part of the lever, 15, in such a position as to stop the movement of the paddle wheel, 17, when said clutch-members are apart.

The electric current is led to the device by the conductors 18. Said conductors are secured to a contact, 19, which is carried by the operation lever, 15. A contact, 21 is secured to a bracket or stand, 20, in such a position to press on and to be in connection with said first named contact to close the circuit when the lever, 15, is in the position to operate the signal clock. The stand, 4, consists of hard rubber and is provided with a series of grooves. A series of electric contact bars, 22, without insulation, are inserted in said grooves. A resistance box, 23, is secured to the stand, 4. Said box is fitted with a series of resistances. Each one of said resistances is arranged for a different strength of current. A series of conductors, 24, are secured to the contact, 21, said conductors must be separately connected, one each to a different resistance, to lead different currents to the contact bars 22, with the exception of the upper one of said conductors, which leads the return currents from all the switches to the conductor 25.

A series of switches, 26, (a separate view of one is shown in Fig. 2), is movably arranged over the top of the frame, 2. Each switch consists of the switch proper and the hollow member, 27, said hollow member, is made of hard rubber and is arranged to carry said switch proper and its conductors. The lower part of the hollow member, 27, is slidably arranged on a rail, 28, which is secured with brackets, 29, to the frame, 2.

The switch proper, 26, (a separate view of which is shown in Fig. 3, and a view of a section is shown in Fig. 4), consists of a member carrying a contact, 30. A second member slidably arranged in said first named member carries a contact, 31. A spring-button, 32, is arranged to move said second member in said first named member for changing the distance between the contacts, 30, and 31. A contact, 33, is secured in the rear of the hollow member, 27, and in

such a position as to press against and to be in connection with the upper contact bar, 22. A conductor, 34, is secured to the said contacts, 33, and the contact, 30, in the switch proper. Slots, 35, are formed in the front and in the rear of the hollow member, 27. Said slots must be located in a transverse position to the direction of each one of the contact bars, 22. A copper rail, 36, is secured by its top and bottom in the hollow member, 27. A slot in said copper rail must be of the same size, and run in the same direction as the slots in 35.

A spring button 37 a separate view being shown in Fig. 5 is arranged in a member 39^b which is slidably arranged in the front slot 35. A contact pin having the form of a T is secured in connection with an insulating member to said spring button to hold with its spring the contact pin 39^d on the copper-rail 36 and to extend said pin out of the rear slot 35 to press on and be in connection with either one of the lower current contacts 22 wherever said spring button 37 is moved. A scale 40 shown in Fig. 2 is provided for said spring button; the positions of the different strength of current contact bars 22. A conductor 41 is arranged in the inside of said switch member to close the circuit between the switch contact 31 on the copper rail 36.

The cooperation of the several parts throughout a complete cycle of movements involved in the operating of the device for the sending of a code, it will be seen that each one of the switches is provided with three different regulating means, first, to regulate the length of the spacing, move the switch as many units away from the last regulated switch as required for the length of the spacing; second, to regulate the length of the impulse move the second switch member in the first switch member to the position for the length of the impulse required, for instance, to produce a short impulse, then the contacts 30 and 31 must be for the distance apart to correspond to the length of the bridging contact 8, to produce the full length of the impulse, move both of said contacts mostly together; third, to regulate the strength of the impulses, pull the spring button 37 to lift the contact pin 39 and move said button in the slot 35 to the positions shown by the numbers 40 to be released to press on and be in contact with the required strength of contact bar 22 and regulate each one of the switches in the same manner.

By using only five units of each one of the above named regulating means it is possible to produce on each one of said switches over one hundred and twenty-five different signs with the same amount of impulses, to operate the transmitter connect the circuit from a battery or other source to the contact

19 which is carried on the operation lever 15, the receiving device which may be a telegraph siphon recorder is connected to the conductor 25 which is secured to the uppermost contact bar 22; when all the switches are regulated pull the operation lever 15 thereby connecting the driving mechanism to the transmitter, closing the circuit by the contacts 19 and 21, the current is lead to the conductors 24, to the resistances 23, to the contact bars 22, to the contact pin 39 to the copper rail 36 to the conductor 41 to the contact 30, the constant speed driving mechanism moves the arm 7 with its bridging contact 8 to bridge the current from the contact 30 over to the contact 31, to the conductor 34 to the contact pin 33, to the uppermost contact bar 22, to the conductor 25 to the telegraph siphon recorder and the arm 7 travels to operate with the bridging contact 8 one switch after the other.

A camera, 42, (a separate view is shown in Fig. 6), is placed in a suitable position to take a picture of dial, with its switches in position for a signal, and is operatively connected to the operating lever of the clock for the purpose of automatically registering the signals. A roll of film, 43, is secured in the upper part of said camera and is secured to an empty spool, 44, in the lower part of said camera. An idle gear wheel, 46, is arranged on the shaft of the spool, 44. One end of a gear rail 47 is slidably arranged in suitable brackets, its other end is slidably arranged in the operating lever 15. A ratchet wheel 45 is secured to the spool 44 and an idle gear wheel 45 is arranged below said ratchet wheel and meshed to the gear rail 47. A grabber 49 is with a pin secured to said idle gear wheel in such a position to engage said ratchet wheel. A grabber, 49, is secured with a pin to said idle wheel and in such a position as to turn the gear wheel, 45, thereby advancing a part of the film by the stopping of the signal clock, with the lever and not to move said film-spool by the return movement of said lever. A bracket, 48, is secured to the gear rail, 47, in such a position as to press a button, 51, on the camera, thereby releasing a shutter to take a picture of the dial with its switches by the starting of the signal clock with said lever.

The frame, 2, with its switches, is, with the hooks 3, removably secured to the stand 4, for the purpose of exchanging one dial with another, for the purpose of providing means to set the switches on one dial in the required position by one operator and for the purpose of using another dial for transmitting the signals, by a second operator.

A second modification of the transmitter is shown in the Figs. 7, 8, 9, 10 and 11. This modification operates the same as the first except that the circuit is made and

broken in two places in the negative line and in the positive line instead of in one side only as in the first modification.

A dial 1 is secured to the upper part of a frame 2. Said frame is with the hooks 3 removably secured to a stand 4. A gear rail 5 is slidably arranged in brackets 6 which are secured to the frame 2. An arm 7 is secured to said gear rail and carries on its upper part two bridging contacts 8 and 8^b shown in a view in Fig. 7. One of said bridging contacts is provided to operate the positive line and the second one to operate the negative line. Suitable springs arranged between said arm and said bridging contacts to give with said contacts perfect circuit connections to the switches. A gear wheel 9 is secured to the main shaft 10 of a suitable type of constant speed driving mechanism, said gear wheel is meshed to the gear rail 5 to move said rail in a straight position by the operation of said driving mechanism. Said main shaft 10 is in two parts, part 10^a and part 10^b. Part 10^a is arranged to turn in a hollow member 11 which is secured in the stand 4. A clutch 12 is secured to the shaft 10^a and is meshed to a clutch 13 which is slidably arranged on the shaft 10^b. A rail 14 is secured to said shaft and is fitted in a corresponding opening in the clutch 13 to connect or disconnect both shafts as shown by a dotted line position of said clutch.

A lever 15 is secured to the clutch 13 to move the clutch member together by the operation of said lever. The speed driving mechanism is arranged on the shaft 10^b.

The stand 4 consists of hard rubber and is provided with a series of grooves running in a parallel direction and arranged in pairs. A series of electric contact bars 22 for the positive current and a series of contact bars 22^b are inserted in said grooves in such a manner to place the contact bars 22 for the positive current in each of the upper grooves of said pair of grooves and the bars 22^b for the negative current one each below said contact bars 22. A box is secured to the stand 4 and is fitted with a series of different strength of resistances 23 for the positive current and of a series of the same strength of resistance 23^b for the negative current, to be secured one pair of the same strength of resistance to one each of the pairs of the contact bar pairs 22 and 22^b with the exception of the uppermost pair of said bars 22^c, 22^a. To close the circuit from a battery or other source to said contact bars 22 and 22^b. A conductor 18 is arranged between the positive pole of the battery and a contact 19 which is carried on the operation lever 15. A second conductor 18^b between the negative pole and a contact 19 on said lever. Two contacts 21 and 21^b must be secured in such a position to press

on and be in connection, the contact 19 with the contact 21 and the contact 19^b with the contact 21^b by the pulling of said lever. Conductors 24 are arranged between said contact 21 and each one of the resistances 23 and between the contact 21^b and each one of the resistances 23^b.

The receiving device which may be a telegraph siphon recorder is connected to the conductors 25 and 25^b which are separately connected to the uppermost bars 22^c and 22^d.

A series of switches 26 a view of a detailed switch is shown in Fig. 8 and a section of same for showing the regulating parts is shown in Fig. 10, said switches are movably arranged over the top of the frame 2 and on a rail 28 which is secured to the frame 2. Each one of said switches consists of the switch proper and a hollow member 27. Said hollow member is made of hard rubber and is arranged to carry said switch proper and the electric current conductors therefor. Each one of said switches consists of a member carrying the contacts 30 and 30^b. A second member movably arranged in said first named member carries the contacts 31 and 31^b. A spring button 32 arranged to move said second member for changing the distance between the contacts 30, 30^b and the contacts 31, 31^b. Two contact pins 33 are secured in the rear of the hollow member 27 and positioned in such a manner to press against and be in connection each one with one of the upper contact bars 22^c and 22^d wherever the switches are moved. A conductor 34 is arranged between the pin 33 and the switch contact 30 and a conductor 34^b between the pin 33^b and the contact 30^b. Slots 35 are inserted in the front and in the rear of the hollow member 27. Said slots must be arranged in a transverse position to the contact bars 22. Two copper rails 36 and 36^b are secured by their tops and bottoms in the hollow member 27 in a parallel position to said slots. A spring bottom 37, a separate view of same is shown in Fig. 9. A square shaft on said button must fit in a square opening in a member 39^b to prevent turning of said shaft in said member. Said member is slidably arranged in the front slot 35. A stop 38 consisting of hard rubber is secured to the shaft on said spring button in such a position as to hold a spring and to rest upon the copper rails 36 and 36^b. Two contact pins 39 and 39^b are secured to said stop in such a position to extend out from the rear slot 35, to press on or be in connection with one of said pins with a contact bar 22 and the copper rail 36 and the second contact pin with a contact bar 22^b and the copper rail 36^b wherever said spring button 37 and the switches are moved. A scale 40 is arranged on the hollow member 27 for showing the positions of each pair of the lower contact bars 22, 22^b. To ex-

change the contact pins 39, 39^a from one position to another pull the spring button 37 and slide the same to the required position. A conductor 41 is secured to the switch contact 31 and the copper rail 36 and a conductor 41^b to the switch contact 31^b and to the copper rail 26^b.

The cooperation of the several parts throughout a complete cycle of movements involved for operating the positive line and the negative current line in the transmitter, after each one of the switches is operated, pull the operating lever 15 thereby connecting with the clutches 12 and 13 the speed driving mechanism to the electric switch device and closing the circuit by the contacts 19, 19^b and the contact 21, 21^b the positive current is lead from the positive pole of a battery to the conductor 18, to the contact 19, the contact 21, to the conductors 24, to the resistances 23, to the contact bars 22, to the contact pin 39, to the copper rail 36, to the conductor 41, to the switch contact 30, the negative current is lead from the negative pole to the conductor 18^b, the contact 19^b, the contact 21^b the conductor 24^b to the resistances 23^b, the contact bars 22^b the contact pin 39^b, the copper rail 36^b, the conductor 41^b and to the switch contact 30^b, the arm 7 with its bridging contacts 8 and 8^b travels to bridge both of said currents in one operation the positive current from the contact 30 over to the contact 31 and the negative current with the second bridging contact 8^b from the contact 30^b to the contact 31^b, the positive current is lead from the contact 31 to the conductor 34, the contact pin 33, the uppermost contact bar 22^c, the conductor 25, and to the telegraph siphon recorder the negative current from the contact 31^b, the conductor 34^b, the contact pin 33^b the uppermost contact bar 22^d, the conductor 25^b and to said telegraph siphon recorder and the arm travels to operate one of said switches after the other.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a variable signal transmitter having in combination a means arranged to start and to stop the operation of said transmitter, a series of switches arranged in a straight path, each one of said switches consists of a member carrying one contact, a second member slidably arranged in said first named member carries a second contact, a spring button, provided to move and to adjust said second member in said first named member to various selective positions to provide means to change the distance between said first and said second named contact and a bridging contact carried by a suitable driving mechanism in said straight path to bridge said members by the starting of said signal transmitter with said means.

2. A variable signal transmitter having in

combination a series of spaced switches, each of the switches comprising two spaced contacts and means whereby the distance between the contacts may be varied, a common electrical connection from one of the contacts of each of said switches, means including a series of contact bars for supplying current of different strengths, adjustable means carried by each of said switches for connecting any one of the contact bars to the other contact, a bridging member movable in a plane including the contacts for electrically connecting the contacts of each switch and means for progressively associating the bridging member with the respective switches whereby a code of impulses of different length and different strength may be transmitted.

3. A variable signal transmitter having in combination a stationary frame, a plurality of switches, means whereby the switches may be positioned at variable distances from each other with respect to the frame, each of the switches comprising two spaced contacts and means whereby the distance between the contacts may be varied, a common electrical connection from one of the contacts of each of said switches, means including a series of bars for supplying current of different strengths, adjustable means carried by each one of said switches for connecting any one of the contact bars to the other contact, a bridging member movable in a plane including the spaced contacts for electrically connecting the contacts of each switch and means for progressively moving the bridging member with respect to the switches on the frame to bridge the respective contacts

successively whereby a code of impulses may be transmitted varying in length, strength and spacing.

4. A variable signal transmitter comprising in combination a stationary frame, a plurality of duplex switches, each switch of the duplex switches comprising two spaced contacts and means whereby the distance between the contacts may be adjusted, means whereby the duplex switches may be positioned at variable distances from each other with respect to the frame, means including a series of bars arranged in pairs on the frame for respectively supplying positive and negative potentials of different values from a source of potential, a common electrical connection for one of the contacts of one pair of each duplex switch and another common connection for one of the other pair, adjustable means for each of the duplex switches for connecting the other contacts of each pair simultaneously to a selected pair of bars, a member comprising two insulated bridging members movable respectively in planes including the pairs of contact members and means for progressively moving the member with respect to the switches on the frame to bridge the respective contacts successively whereby a code of impulses may be transmitted varying in length strength and spacing through the common connections.

Signed at New York city, borough of Manhattan, in the county of New York and State of New York, this 15 day of December A. D. 1924.

CHARLES H. KESSES.