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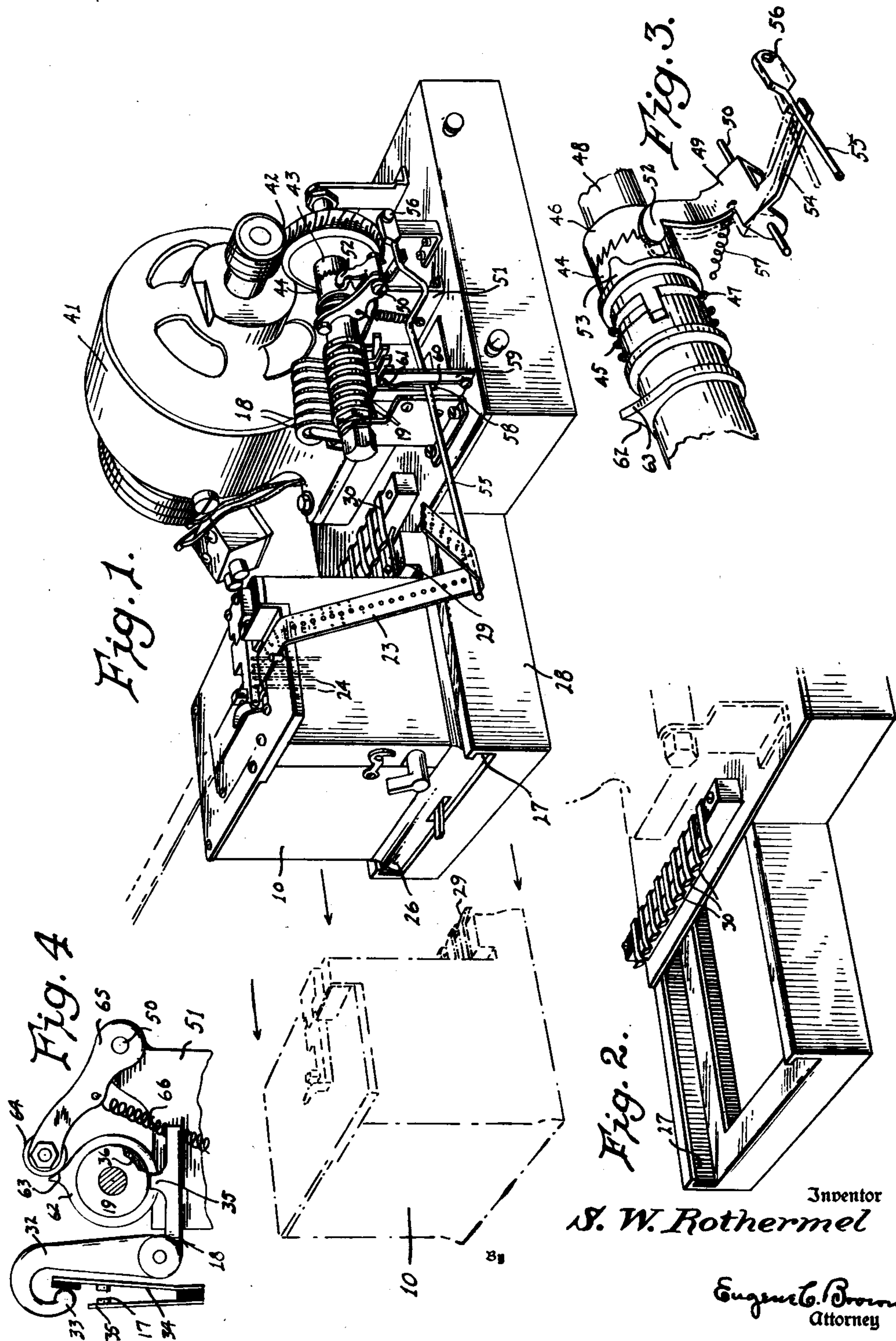
S. W. ROTHERMEL

1,805,374

DISTRIBUTOR TRANSMITTER FOR SIMPLEX TELEGRAPH CIRCUITS

Filed Sept. 6, 1929

2 Sheets-Sheet 1



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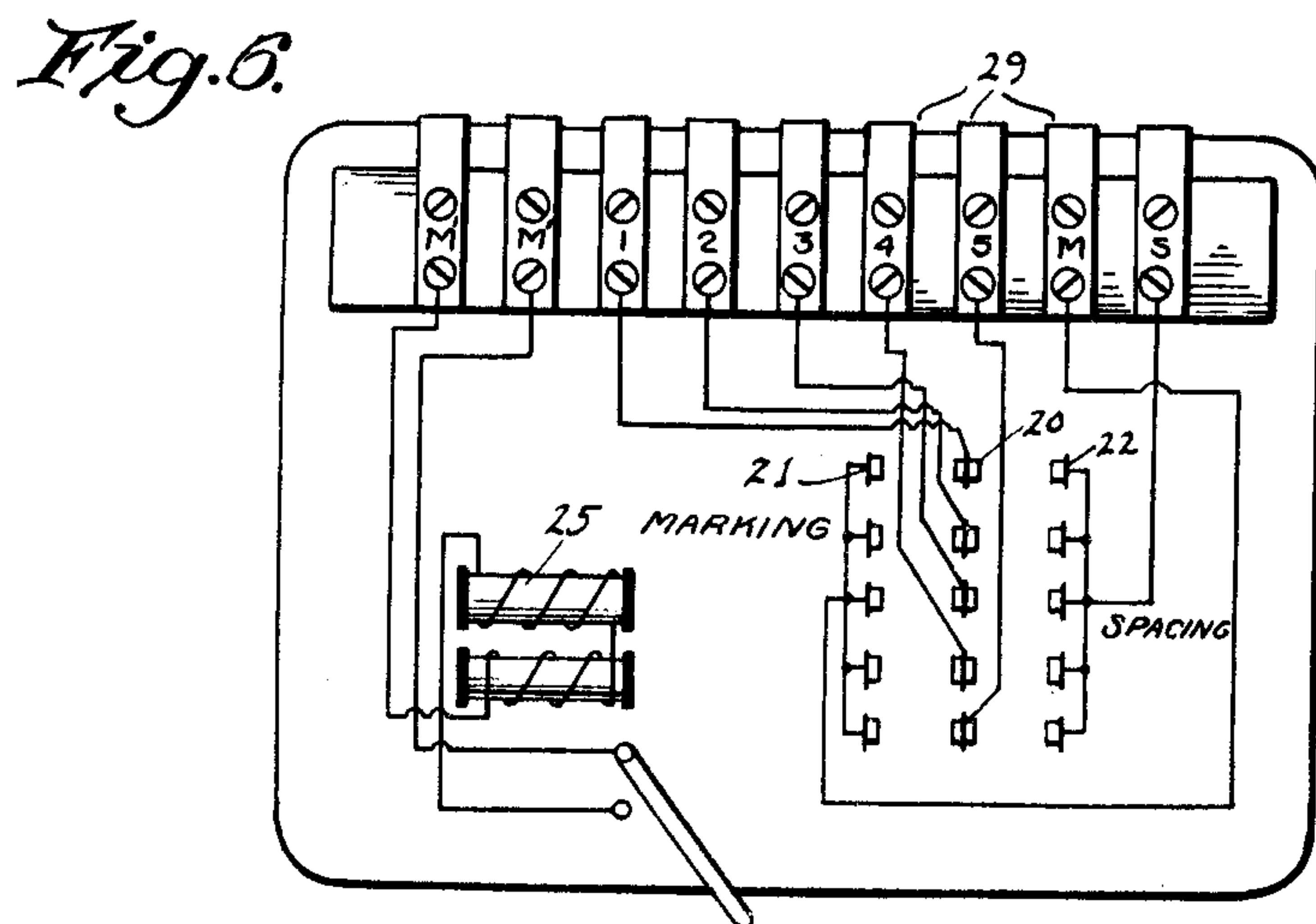
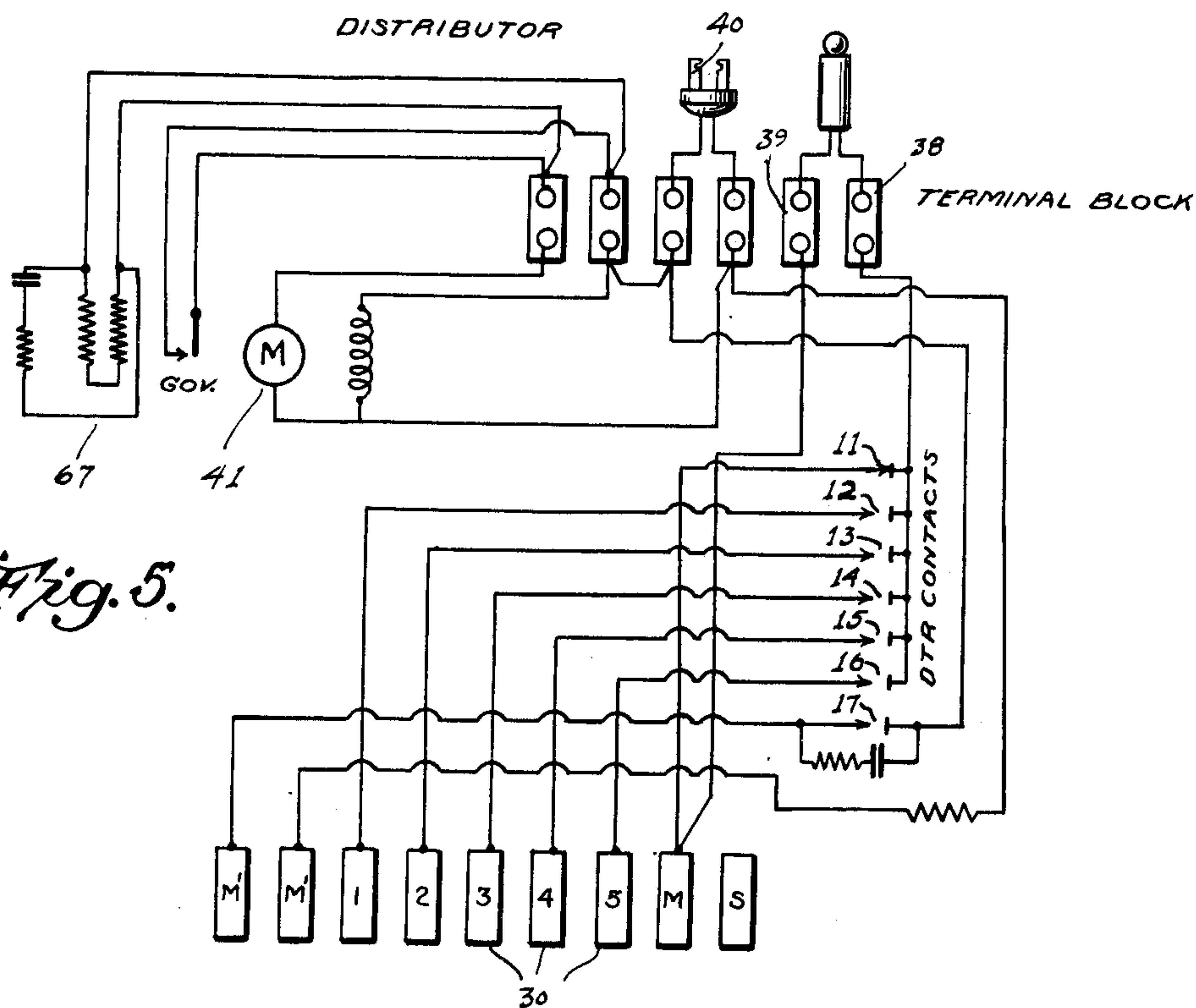
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DISTRIBUTOR TRANSMITTER FOR SIMPLEX TELEGRAPH CIRCUITS

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UNITED STATES PATENT OFFICE

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DISTRIBUTOR-TRANSMITTER FOR SIMPLEX TELEGRAPH CIRCUITS

Application filed September 6, 1929. Serial No. 390,726.

This invention relates to a distributor-transmitter for a telegraph system and more particularly to a perforated tape controlled transmitter and distributor for the operation of so-called simplex printers at a distant station.

Heretofore perforated tape controlled transmitters have been used only in multiplex telegraph systems the transmitter setting up, on the distributor segments of a rotary distributor, the combination of positive and negative impulses corresponding to the various characters previously prepared on a paper tape. The signals transmitted to the line by such an arrangement cannot be used for the operation of a simplex printer since the simplex printer depends for its operation upon the transmission of a start and stop impulse preceding and following each character code combination. The operation of simplex printers at the distant station has been effected, prior to the present invention, entirely through a manually operated keyboard transmitter which does not permit the system to be operated at its maximum speed.

The primary object of the present invention is, therefore, to increase the speed of operation of a system employing simplex printers by providing a distributor-transmitter for such simplex printers controlled by a perforated tape.

A further object is to provide a novel stop mechanism for the distributor-transmitter controlled by the tape when the supply of perforated tape being supplied to the transmitter has decreased to a predetermined minimum.

Other objects and advantages will hereinafter appear.

In accordance with my invention I provide a distributor comprising a series of cam operated contacts similar to those employed upon the regular simplex keyboard transmitter and a tape controlled transmitter for setting up on the distributor contacts the combinations of marking and spacing impulses comprising the various characters to be transmitted.

The cams are disposed so as to close the

distributor contacts in succession for transmitting the start and stop impulses and intermediate code signal impulses, a separate contact being provided for completing an electrical circuit for operating the tape transmitter mechanism after each cycle of operation of the distributor, to advance the tape forward and set up the succeeding character combination. The contact closing cams are rotated continuously as long as the transmitter does not catch up to the supply of perforated tape. However, should the supply of perforated tape be decreased to a predetermined minimum, the tightening thereof effects the operation of a clutch mechanism to disengage the cam shaft from its driving shaft and thereby discontinue the operation of the transmitter.

In order that the invention may be more fully understood reference will be had to the accompanying drawings in which:

Figure 1 is a perspective view of the distributor-transmitter assembly;

Figure 2 is a portion of the supporting frame for the assembly showing the transmitter unit removed therefrom;

Figure 3 is a fragmentary perspective view of the cam shaft and clutch mechanism of the distributor;

Figure 4 is an elevation, partly in section, of the distributor contacts and cam shaft;

Figure 5 is a circuit diagram of the distributor; and

Figure 6 is a diagrammatic illustration of the transmitter.

My distributor-transmitter comprises a tape controlled transmitter enclosed within a suitable casing 10 and a distributor comprising a series of seven contacts 11, 12, 13, 14, 15, 16 and 17 connected to the transmitter and to the line, each contact having an individual contact lever 18 and operating cam 19 for closing the contacts in succession to transmit to the line the signal combination previously set up by the transmitter.

The tape controlled transmitter may be of the type disclosed in United States Patent to Benjamin, No. 1,298,440 and briefly comprises a series of five contact tongues 20 connected to terminals designated by numerals

1, 2, 3, 4 and 5. Each contact tongue 20 moves between two contact points 21 and 22 the former of which is connected to the marking terminal M and the other of which is connected to the spacing terminal S. The prepared tape 23 passes over the top of the casing 10 and over a series of five selecting pins 24 which are normally urged upward by springs (not shown) to set up the contact tongues 20 either against their marking or spacing contacts depending upon whether the selecting pins 24 pass through perforations in the tape or engage a blank portion thereof.

A magnet 25 having its winding connected to the terminals M' effects of the operation of the transmitter mechanism. Magnet 25 is energized once each revolution of the cam shaft to attract its armature, which withdraws the pins 24 from the perforations in the tape and feeds the tape forward one character space. Upon release of the armature the selecting pins move upward by spring tension against the perforated tape so as to set up the succeeding code combination through contact tongues 20. The specific construction of the transmitter forms no part of the present invention and is fully disclosed in the aforementioned Benjamin patent. Therefore it is unnecessary to illustrate and describe the same in further detail herein.

The transmitter has a flaring base 26 which engages in a guide way 27 formed in the base 28 of the distributor-transmitter assembly so that the transmitter unit may be removed for adjustment or replacement. Each of the terminals 29 of the transmitter engage corresponding spring contacts 30 mounted on the base 28, the contacts 30 being electrically connected to the various distributor contacts and terminal block as shown in Figure 5.

Referring now to the distributor mechanism, the contact levers 18, one of which is provided for each of the contacts 11 to 17, are pivoted at 31 and have vertical arms 32 each provided with a hooked end 33 engaging one of a pair of contact arms 34 and 35 of the contacts 11 to 17. The transmitter contacts with the exception of contact 11 are normally held open by the contact levers against the tension of the spring contact arms 34. The horizontal arm of each contact lever has a hump 35 thereon engaged by the periphery of the cam 19 whereby the contacts are held open. A depression 36 is formed in one side of the cam which when opposite the hump 35 permits the contact lever 18 to rock under the pressure of the spring contact arm 34 to close the contact. The cams are arranged upon their shaft 37 in such manner that as the shaft revolves the depressions come opposite the humps of each of the contact levers successively so that during each

revolution of the cam shaft the contacts 11 to 17 are closed and opened in succession.

One side of each of the contacts 11 to 16 is connected to the line terminal 38 and the opposite sides connected respectively to the marking terminal M and terminals 1, 2, 3, 4 and 5 of the transmitter unit. The marking terminal M is also connected to the line terminal 39. The spacing terminal S is left unconnected since the simplex printers operate on a combination of current and no current impulses rather than positive and negative impulses, although where double current operation is desired the spacing terminals may be connected to current of opposite polarity from terminal M.

Contact 17 controls a local circuit for operating the magnet 25 from the power terminal 40.

When the transmitter is at rest, the contact 11 is closed and marking current is being sent to the line. As the cam shaft revolves through one revolution the contact 11 first opens sending a start impulse over the line and the contacts 12 to 16 then close and open in succession sending the code signal combination to the line, after which the local contact 17 closes to set up the succeeding character combination through the contact tongues 20 of the transmitter. The contact 11 closes immediately after contact 16 opens, thus sending the stop impulse. This cycle is repeated for each succeeding revolution of the cam shaft.

The cam shaft is driven by a motor 41 through gears 42 and a ratchet clutch 43. The driven ratchet 44 of the clutch is keyed to the cam shaft by a key and slot 45 so as to be movable longitudinally into engagement with the driving ratchet 46 by a clutch spring 47. The driving ratchet 46 is rigidly fixed to the driving shaft 48.

Disengagement of the clutch is effected by a stop arm 49 pivoted at 50 to a bracket 51. The stop arm has a curved end 52, extending into the path of a cam 53 on the driving ratchet, and a horizontal arm 54 engaged by a lever 55 pivoted at 56. The stop arm is urged towards the driven ratchet 44 by a spring 57 so that upon upward movement of the lever 54 the stop arm moves against the driven ratchet and as the shaft revolves the cam 53 engages the stop arm thus moving the driven ratchet to the left and effecting disengagement thereof. The cam 53 is disposed on the cam shaft in such angular position that the cam shaft is brought to rest with the contacts 11 to 17 in the position shown in Figure 5.

The tape 23 passes under the end of the lever 55 so that when the supply of perforated tape for the transmitter has decreased to a predetermined minimum so as to make the tape taut it will raise the lever 55 and

discontinue the operation of the transmitting and distributing mechanism.

The lever 55 passes through a slot 58 in a vertical plate 59, a spring 60 being mounted on the plate and having a curved upper end 61 extending across the slot to maintain the lever 55 in its elevated position, when manually lifted above such curved end.

In order to prevent back movement of the cam shaft and to insure its stopping in the proper position a cam 62 is provided on the cam shaft having an inclined face 63 engaged by a jockey roller 64 arranged on the end of a lever 65 pivoted at 50 to the bracket 51. The jockey roller 64 is pressed against the cam 62 by a spring 66. The cam 62 is positioned on the cam shaft so that its inclined face 63 will be engaged by the jockey roller just as the shaft is brought to rest by the stop arm 49. It will be appreciated that if the cam shaft should work backwards after being brought to rest, the contact 17 might be closed and thus supply current from the power line to the magnet 25. The cam 62 and jockey roller 64 prevents such an occurrence.

The motor is supplied with current from the power terminal 40 and is provided with the usual governor 67 for maintaining the speed constant.

It will be noted that I have provided a simple distributor adapted to be employed with a standard form of tape transmitter for transmitting stop, start and code signals to the line of the same character as transmitted by the usual keyboard transmitter, thus enabling the usual simplex printer to be operated at the distant station at maximum speed.

I am aware that the invention may be embodied in other specific forms without departing from the essential attributes thereof and therefore, I do not desire to be limited to the exact details shown and described except in accordance with the following claims.

What is claimed is:—

1. A distributor-transmitter for a telegraph system comprising a perforated tape transmitter and a distributor, said distributor having a plurality of switches each having one contact connected to the line and the opposite contact connected to the transmitter and a plurality of cams for closing said switches in succession to distribute to the line in proper sequence the character combinations previously set up by said tape transmitter.
2. A distributor-transmitter for a telegraph system comprising a transmitter controlled by a perforated tape, a distributor comprising a plurality of switches each having one contact connected to the line and the opposite contact connected to the transmitter, means for closing said switches in succession to transmit to the line a character combination previously set up by said transmitter, a separate switch for said distributor and means for closing the same after the transmission of said

character combination, to complete a circuit to actuate said tape transmitter, whereby the succeeding character combination will be set up.

3. A distributor transmitter for a telegraph system comprising a perforated tape transmitter and a distributor said distributor having a plurality of contacts connected to the line and to the transmitter, a shaft having a plurality of cams for closing said contacts in succession to distribute to the line in proper sequence the character combinations previously set up by said tape transmitter, means for rotating such shaft continuously to transmit to the line a plurality of character code combinations and means for interposing a stop impulse and a start impulse intermediate each character code combination transmitted.

4. A distributor transmitter for a telegraph system comprising a perforated tape transmitter for setting up a code signal in accordance with perforations in a previously prepared tape, a tape stepping device for said transmitter, a circuit for said stepping device, a distributor including means for completing said circuit during each cycle of operation of said distributor; a driving shaft for the distributor, a source of power for said driving shaft, a clutch intermediate said driving shaft and source of power and a lever adapted to be engaged by said tape to effect the disengagement of said clutch when the length of tape being supplied to the transmitter has decreased to a predetermined minimum.

5. A distributor transmitter for a telegraph system comprising a transmitter controlled by a perforated tape, a distributor comprising a switch for each unit of the character code, each switch having one contact connected to the line and the opposite contact connected to the transmitter, a start-stop switch also connected to the line and means for closing said switches in succession to transmit to the line the character combination previously set up by said transmitter preceded by a start impulse and followed by a stop impulse, a separate switch for said distributor, and means for closing the same during each cycle of operation of the distributor to complete a circuit for actuating said tape transmitter to set up the succeeding character combination.

In testimony whereof I affix my signature.
SAMUEL W. ROTHERMEL.