May 16, 1933. J. W. LONG ET AL 1,909,201

PRINTING TELEGRAPH SYSTEM

Filed Oct. 29, 1931 3 Sheets-Sheet 1

FIG. 1

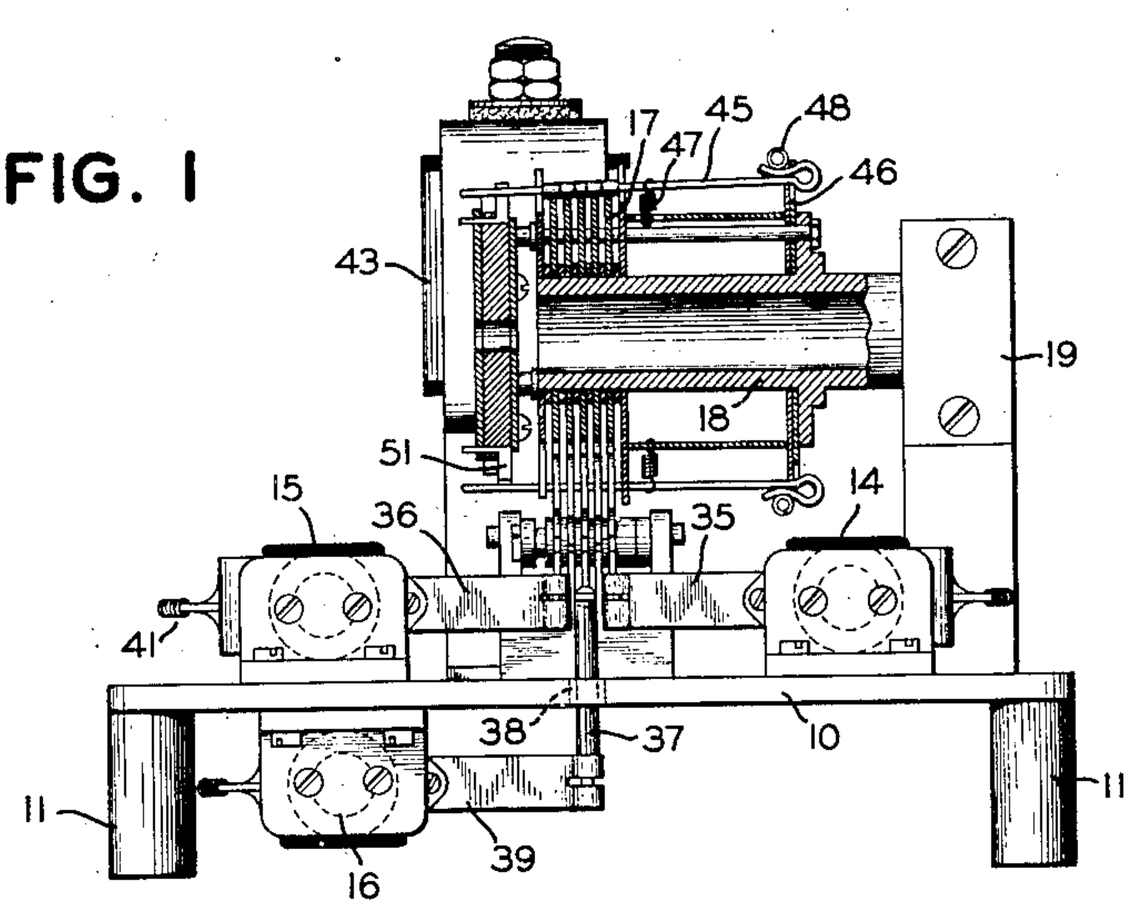


FIG. 2

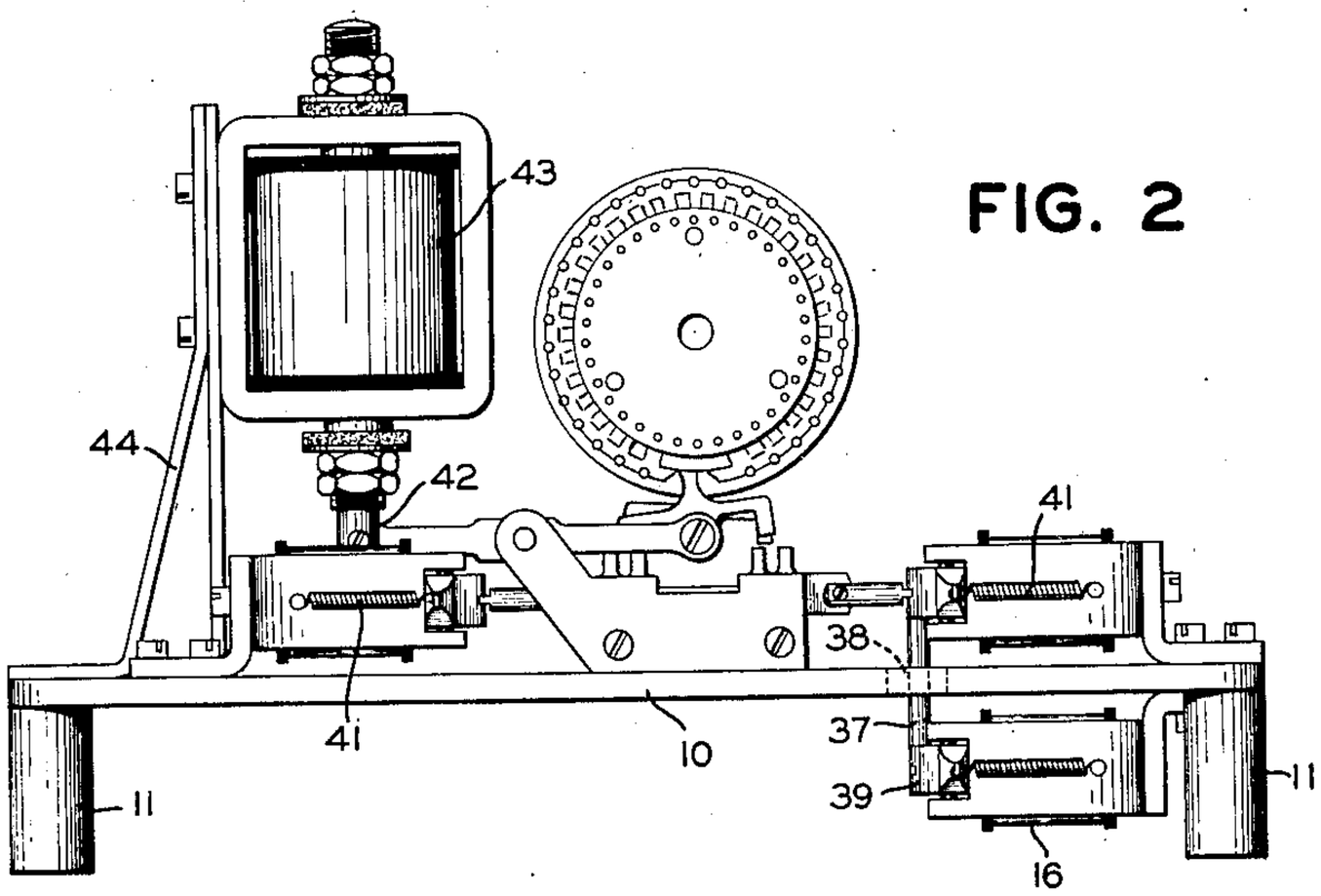


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FIG. 4

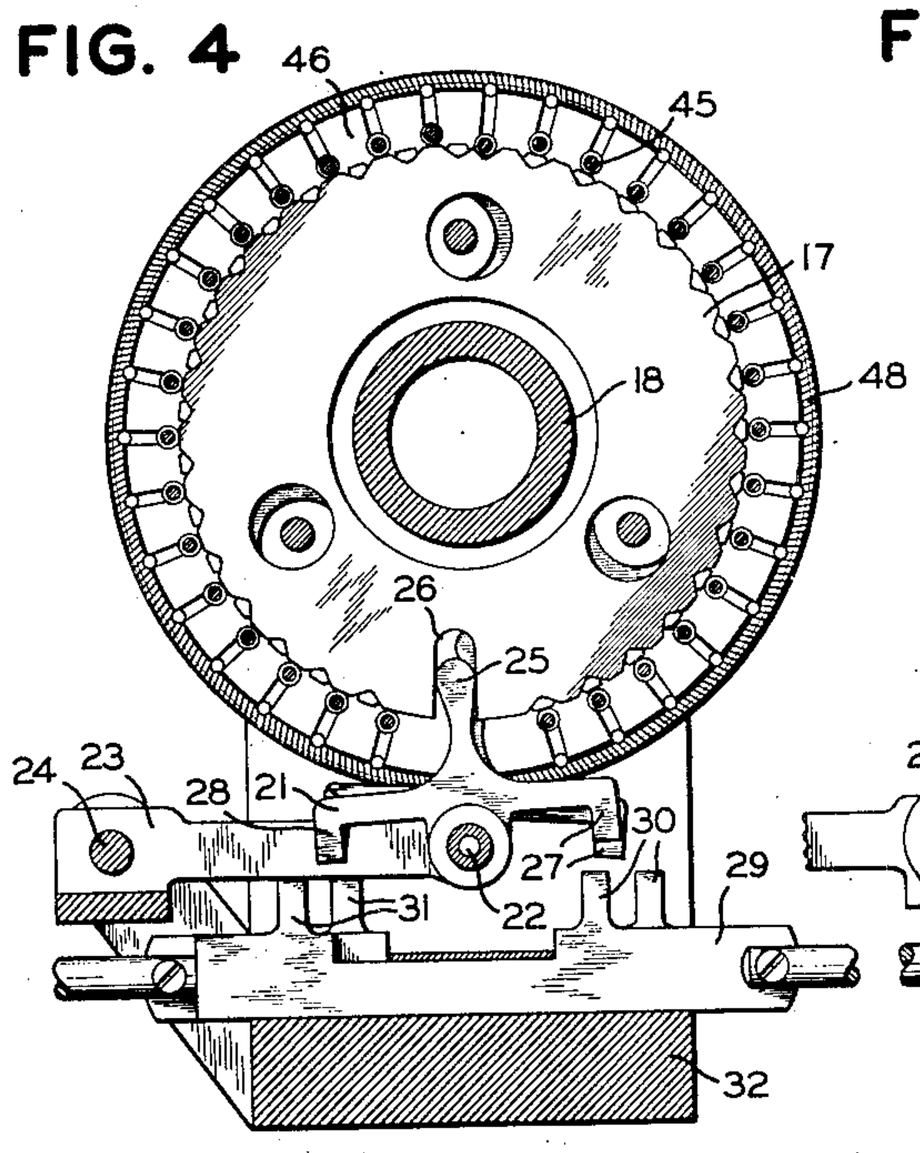



FIG. 5

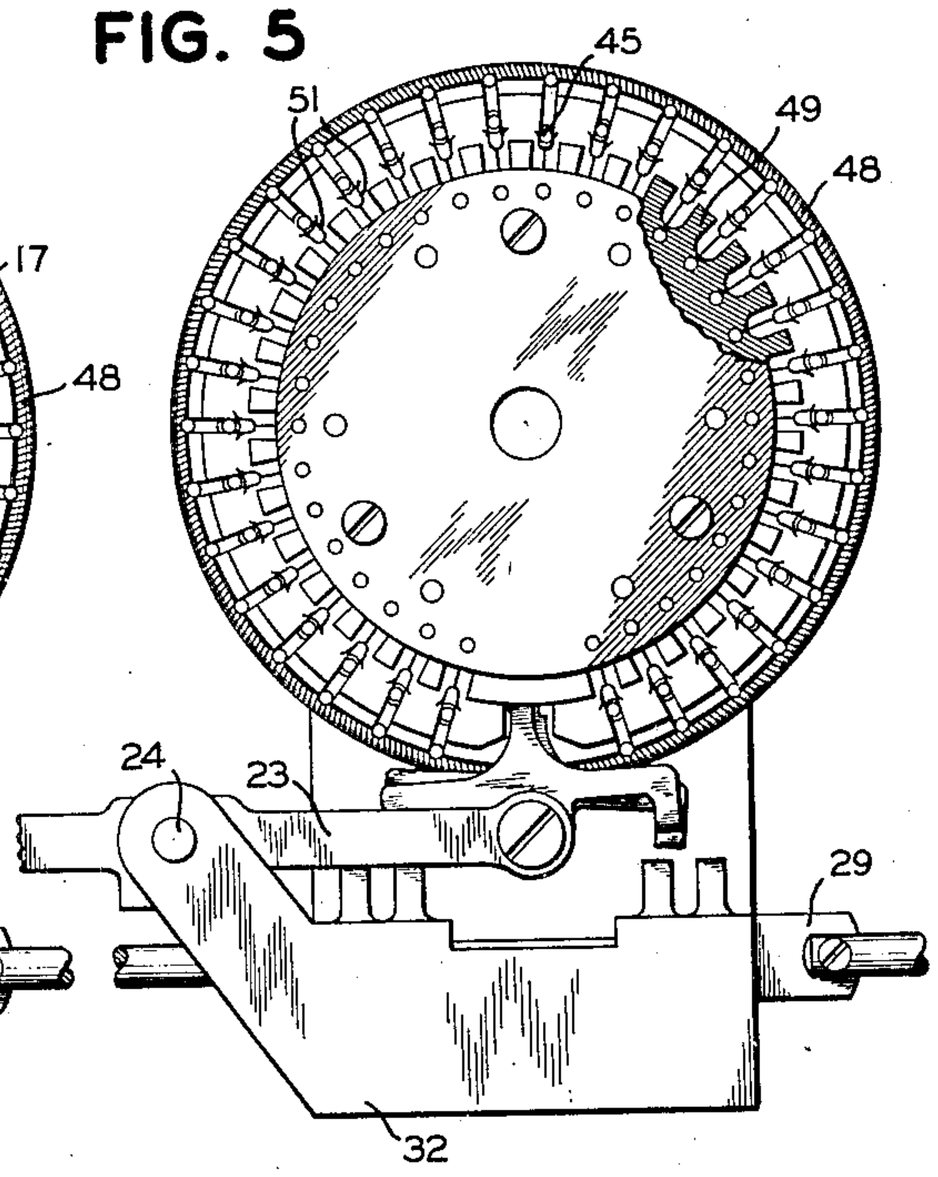
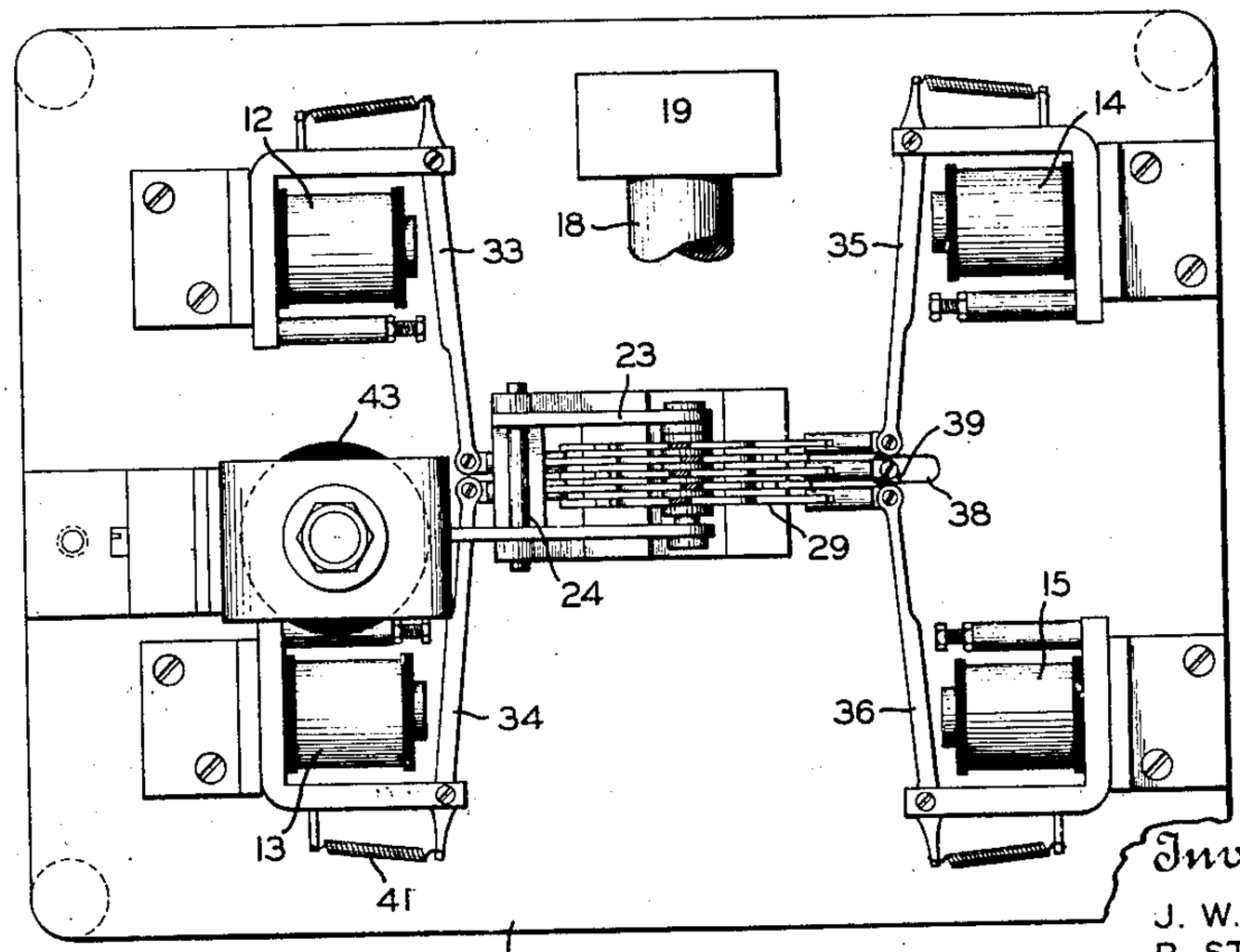



FIG. 3

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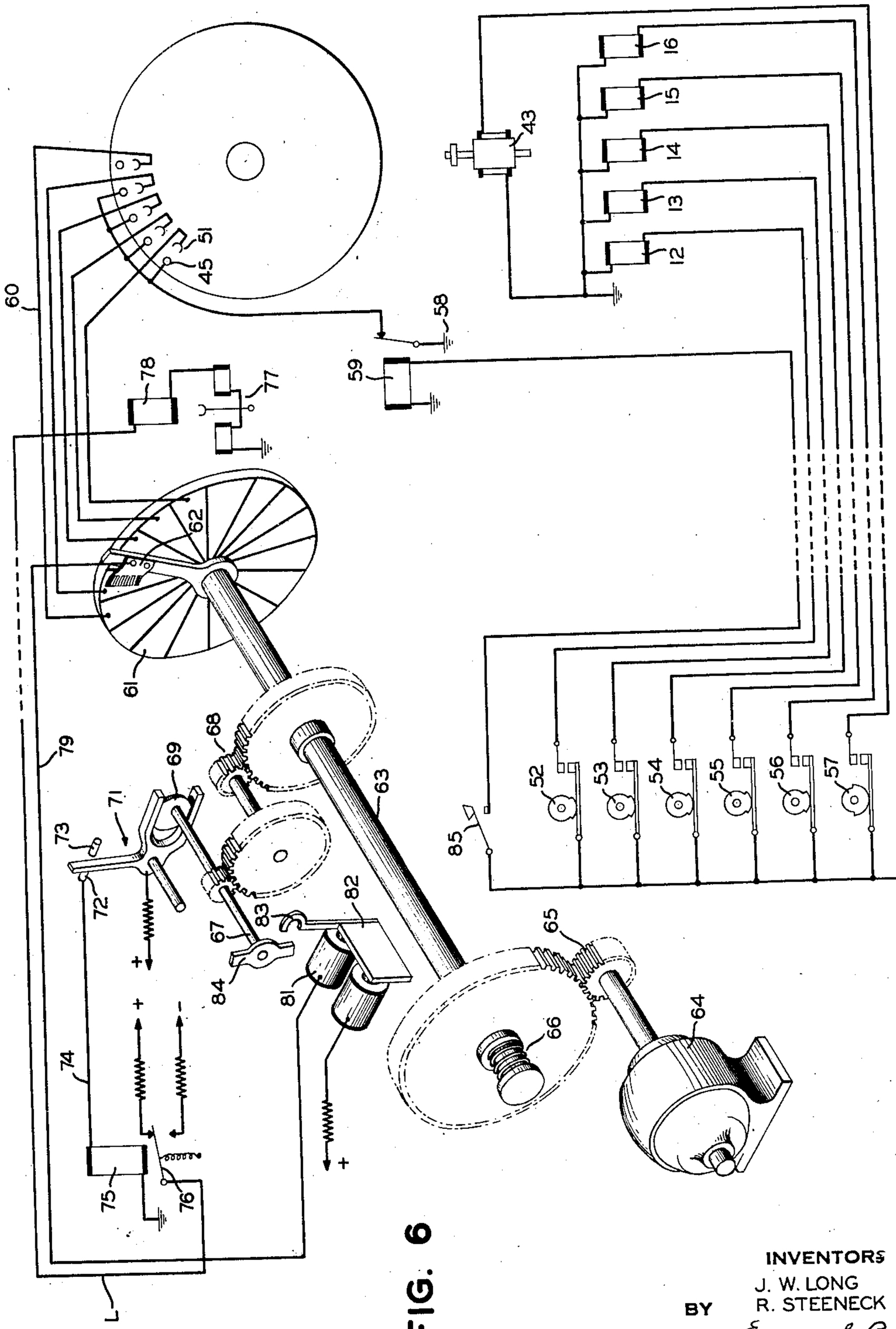


FIG. 6

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Patented May 16, 1933 1,909,201

# UNITED STATES PATENT OFFICE

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## PRINTING TELEGRAPH SYSTEM

Application filed October 29, 1931. Serial No. 571,898.

This invention relates to a printing telegraph system, and more particularly to the transmitting mechanism for a printer of the type in which the type wheels are operated step-by-step, as shown for instance in the patent to Burry, No. 680,693 of August 20, 1901.

In present day high speed telegraph systems, aside from ticker transmitting systems, it is almost universal practice to employ a five or six unit code of the Baudot type, and the apparatus for transmitting signals of this type has been developed to a high degree of perfection.

One of the objects of the present invention is to provide a mechanism which will enable such transmitting apparatus, operating on the Baudot code, to be employed for transmitting step-by-step signals.

Another object is to produce a selector operable by signals of the Baudot type for selectively completing one of a plurality of circuits.

Other objects and advantages of the invention will subsequently appear.

In accordance with our present invention we control the transmission of the alternating current impulses, or step-by-step signals by a transmitter of the sunflower type having segments corresponding to each printing position of the type wheel, the operation of the sunflower being controlled by means of a multi-contact selector, in turn controlled by a transmitter utilizing a five or six unit code. The transmitter may be operated by a manual keyboard or through a perforated tape or other type of storage element.

The several features of the invention will be better understood from a consideration of the accompanying drawings, in which:

Fig. 1 is a side elevation partly in section of the multi-contact selector embodying the invention;

Fig. 2 is an end elevation of the selector;

Fig. 3 is a plan view thereof;

Fig. 4 is an enlarged detailed view of the selecting mechanism;

Fig. 5 is an enlarged detailed view of the contact mechanism; and

Fig. 6 is a diagrammatic view of the transmitting apparatus and circuit arrangement therefor.

The multi-contact selector shown in Figs. 1 to 5 will first be described. It comprises a base plate 10 mounted upon post 11 and carrying on its upper side a group of four selecting magnets 12, 13, 14 and 15, and on its lower side a fifth selecting magnet 16.

A group of five code disks 17 are mounted for limiting rotative motion upon a cylinder 18, carried above the plate 10 by a bracket or standard 19. Each of the code disks is notched and they are so arranged that in each position thereof a single row of notches are in alinement axially of the disks, as is well understood by those versed in the art. The disks are each provided with an individual shift lever 21, pivoted at 22 upon an operating lever 23, which in turn is pivoted at 24. Each shift lever has an upwardly extending arm 25 engaging in a slot 26 in its corresponding code disk.

The shift levers are of inverted T shape and the outwardly extending arms of each lever is provided with a pair of downwardly extending lugs 27, 28. Disposed below the shift levers is a set of five shift bars 29, each bar having a pair of upstanding lugs 30, 31, one of which is arranged to be positioned beneath one of the lugs of the shift levers 21. The shift bars slide in a guide block 32 and are secured to the free ends of the armatures of the electromagnets 12 to 16. The center shift bar is connected to the armature of its operating magnet 16 through a vertical pin 37 extending through an aperture 38 in the plate 10. The shift bars are normally held in spacing position by the armature springs 41 and are shifted to marking position by the magnets 12 to 16 in accordance with a permutation code.

With the shift bars in a predetermined position, that is, with the lugs 30 or 31 beneath predetermined lugs 27 or 28 on the shift levers, the shift levers will be rocked about their pivot either to the right or left when moved downwardly with the operating lever 23, depending upon the engagement of

their lugs with the lugs 30 or 31 of the shift bars. The code disk may thus be rotated in one direction or the other to bring a particular row of notches into alignment.

The outer end of the operating lever 23 is connected to the plunger 42 of a solenoid 43, mounted on a bracket 44 above the plate 10.

Disposed about the code disks 17, in an annular row, are a plurality of contact rods 45 pivoted in perforal slots in a circular plate 46. The rods 45 are pressed against the code disks by individual coiled springs 47 and they are held in the notches of the plate 46 by an annular coiled spring 48.

Concentric with the code disks is an insulating disk 49 having around its periphery a plurality of U-shaped recesses containing U-shaped contacts 51, disposed in radial alignment with the contact rods 45. The rods 45 are normally held out of engagement with the contacts 51 by the code disks but when a row of notches in the code disks line up, one of the rods is moved radially into the aligned notches, by its spring 47, and thus into engagement with its contact 51.

The contacts 51 are insulated from each other and when engaged by one of the rods 45 may complete any desired selective circuit. In the present instance we have shown them completing circuits for controlling the operation of a step-by-step transmitter.

Referring to Figure 6, the selecting magnets 12 to 16 and the operating solenoid 43 are shown controlled from a group of six transmitting cams 52 to 57 respectively of a keyboard transmitter. Obviously they could also be controlled from the contacts of a tape or storage transmitter operating on a permutation code. The rotation of the transmitting cams 52 to 56 causes the magnets 12 to 16 to be operated in accordance with a prearranged code, thereby shifting the code bars 29 into predetermined positions after which the cam 57 completes the circuit from the operating solenoid 43 to complete the shift function and thereby establish a circuit from ground to 58 through the back contact of a cut out relay 59 and thence to contact rods 45 in parallel, and a selected one of the U-shaped contacts 51. The contacts 51 are individually connected by a group of conductors 60 to the segments of a selecting head 61. The selecting head is engaged by a brush 62 fast to the shaft 63 driven by a uniform speed motor 64 through gears 65 and a slip clutch 66. The shaft 63 drives a parallel shaft 67 at an increased speed through the gear train 68. An eccentric 69 on the shaft 67 operated a pole changing switch 71 connected to positive battery and arranged to alternately engage contacts 72 and 73. Contact 72 is connected by a conductor 74 to a pole changing relay 75, whereby the tongue of the relay is caused to follow the movement of the tongue of the switch 71. The contacts of the pole changer are connected to positive and negative battery respectively and the tongue 76 thereof is connected to the outgoing line L. Consequently as the shafts 63 and 67 rotate, current alternations are transmitted over the line L to the distant printer and when the rotation of the shafts is stopped steady current is transmitted over the line.

The current alternations operate the escapement magnet 77 of the receiving printer to step the type wheel ahead, but they do not operate the slow acting press magnet 78. The press magnet is operated by the steady current transmitted following the escapement impulses.

The stopping of the shafts 63 and 67 at the proper position is controlled by the particular contact of the multi-contact selector closed in response to the permutation code, whenever the brush 63 engages the segment connected to the selected contact. This circuit is completed from the grounded contact bars 45, the selected contact 51 and its conductor 60 through the segment of selector head 61 connected thereto and thence through brush 62 and conductor 79 to the stop magnet 81 and to positive battery. The stop magnet when energized attracts its armature 82 to position a stop member 83 in the path of a stop clip 84 carried by the shaft 67. As the shafts 63 and 67 are thus brought to rest the pole changer 75 is held in its last set position, transmitting steady current to line. The characters on the type wheel of the receiving printer correspond to the position of the segment of the selector head 61 and since the type wheel moves in unison with brush 62, the stopping of the brush on a predetermined segment results in the stopping of the type wheel with the corresponding character in printing position. As stated, the following prolonged impulse actuates the press mechanism of the printer.

A manual switch 85 is provided for completing the circuit to the cut-out magnet 59 by means of which the selecting circuits may be interrupted at the ground 58 if desired. Obviously, the switch 85 may be automatically controlled in any suitable manner.

It will be noted that in accordance with our invention we are able to provide a plurality of selective circuits by means of a simple compact mechanism in response to signals of the permutation code type. These selected circuits readily permit of the control of a step-by-step transmitter but of course may be employed for controlling other electrically operated devices. The arrangement provides means for reducing the number of control wires between the keyboard transmitter and the step-by-step or pole changing transmitter. This is impor-

tant where the keyboard mechanism is arranged adjacent a source of information and the transmitting mechanism in an operating arm at a remote point. Thus for instance the keyboard transmitter may be arranged at a stock exchange, news bureau or other place connected by the seven conductors to the transmitting mechanism located in a telegraph office some distance away.

Obviously various modifications and changes will occur to those skilled in the art within the scope of the present invention. Therefore, we do not desire to be limited to the exact details shown and described, except in accordance with the appended claims.

What we claim is:

1. In a telegraph system, a transmitter comprising a plurality of code elements arranged to be positioned in accordance with a permutation code, a plurality of contact bars greater in number than the number of said code elements actuated selectively by the positioning of said code elements, selective circuits completed through said contact bars and means for transmitting groups of current alternations, the number of current alternations in each group being controlled by said selective circuits.

2. In a telegraph system, a transmitter comprising a plurality of code elements arranged to be positioned in accordance with a permutation code, a plurality of contact bars actuated by the positioning of said code elements, a segmented selector head, a pole changer and means for controlling the operation of said pole changer for transmitting variable numbers of current reversals including said contact bars and selector head.

3. In an electrical selector, a plurality of code elements, pivoted shift levers therefor, fulcrum means for said shift levers arranged to be positioned in accordance with a permutation code in one of two positions adjacent said shift levers, means acting after the positioning of said fulcrum means for rocking the shift levers about said fulcrums to shift the code elements, contact bars selectively operated in accordance with the positioning of the code elements, contacts cooperating with said bars and selective circuits completed through said contacts and contact bars.

4. In a signal transmitting system, a rotary contact mechanism, a plurality of code elements, shift levers therefor, fulcrum members for said shift levers arranged to be positioned in accordance with a permutation code in one of two positions, means acting to rock said shift levers about said fulcrum members to shift the code elements, contact bars selectively operated by said code elements in each position thereof, contacts cooperating with said bars and selective circuits completed jointly through said contacts, contact bars and said rotary contact mechanism.

5. In an electrical selector, a plurality of code disks, pivoted shift levers for said disks, fulcrum members arranged to be positioned in accordance with a permutation code in one of two positions adjacent said shift members, individual actuating magnets for said fulcrum members, electromagnetic means acting after the positioning of said fulcrum members for rocking the shift levers about the fulcrum members to shift the code disks, contact bars selectively operable by the code disks in each position thereof, contacts cooperating with said bars and selective circuits completed through said contacts and contact bars and said rotary contact mechanism.

6. A telegraph transmitting system comprising a rotary contact mechanism, a pole changer, a selector head for controlling the operation of the pole changer, a brush cooperating with said selector head, a plurality of code disks, pivoted shift levers therefor, fulcrum means for said shift levers adapted to be positioned in accordance with a permutation code in one of two positions adjacent the shift levers, individual actuating magnets for said fulcrum means, electromagnetic means for rocking said shift levers about said fulcrums to position the code disks, contact members selectively operable by the code disks in each position thereof, contacts cooperating with said contact members and selective circuits completed jointly through said contacts, contact members and said selector head in a predetermined position of the selector head brush.

7. A telegraph transmitter comprising a selecting mechanism having a plurality of code elements arranged to be positioned in accordance with a permutation code, individual electrical contacts closed mechanically by said code elements, the number of said contacts being greater than the number of code elements, and a pole changer for transmitting variable numbers of impulses controlled by said selector.

8. A telegraph transmitter comprising a contact selecting mechanism having a plurality of code elements arranged to be positioned in accordance with a permutation code, individual electrical contacts closed mechanically by said code elements, the number of said contacts being greater than the number of code elements, a pole changer for transmitting variable numbers of impulses, a stop mechanism therefor and a selector head associated with the contact selector, said stop mechanism being controlled by selective circuits completed through the contact selector and selector head in predetermined positions of the latter.

9. A telegraph transmitter comprising a selecting mechanism having a plurality of code elements, a permutation code transmit-

ter, means responsive to signals originating at said transmitter for positioning said code elements in accordance with a permutation code, individual electrical contacts closed mechanically by said code elements, the number of said contacts being greater than the number of said code elements, and a pole changer for transmitting variable numbers of impulses, controlled by said selector.

10. A telegraph transmitter comprising a selecting mechanism having a plurality of code elements, a permutation code transmitter, means responsive to signals originating at said transmitter for positioning said code elements in accordance with a permutation code, individual electrical contacts closed mechanically by said code elements, the number of said contacts being greater than the number of said code elements, a pole changer for transmitting variable numbers of impulses, a stop mechanism therefor and a selector head associated with the contact selector, said stop mechanism being controlled by selective circuits completed through the contact selector and selector head in predetermined positions of the latter.

11. In a telegraph system, a transmitter comprising an impulse generator and control means for said generator, said control means consisting of a selector operable from permutation code character combinations and having an individual electrical contact for each character.

12. In a telegraph system, a transmitter comprising an impulse generator having definite stop positions and control means for said generator, said control means consisting of a selector operable from permutation code character combinations and having an individual electrical contact for each stop position of said generator.

13. In a telegraph transmitter, a selector controlled from permutation code character combinations, said selector having a separate member for each character to be selected, and an impulse generator, the number of impulses transmitted from said generator being determined by said selector members.

14. In a telegraph transmitter, an impulse generator having a number of stop positions, a selector controlled from permutation code character combinations, said selector having a separate member for each said stop position of the impulse generator, the number of impulses transmitted from said generator being determined by said selector members.

In testimony whereof, we affix our signatures.

JAMES W. LONG.
ROBERT STEENECK.