

March 21, 1933.

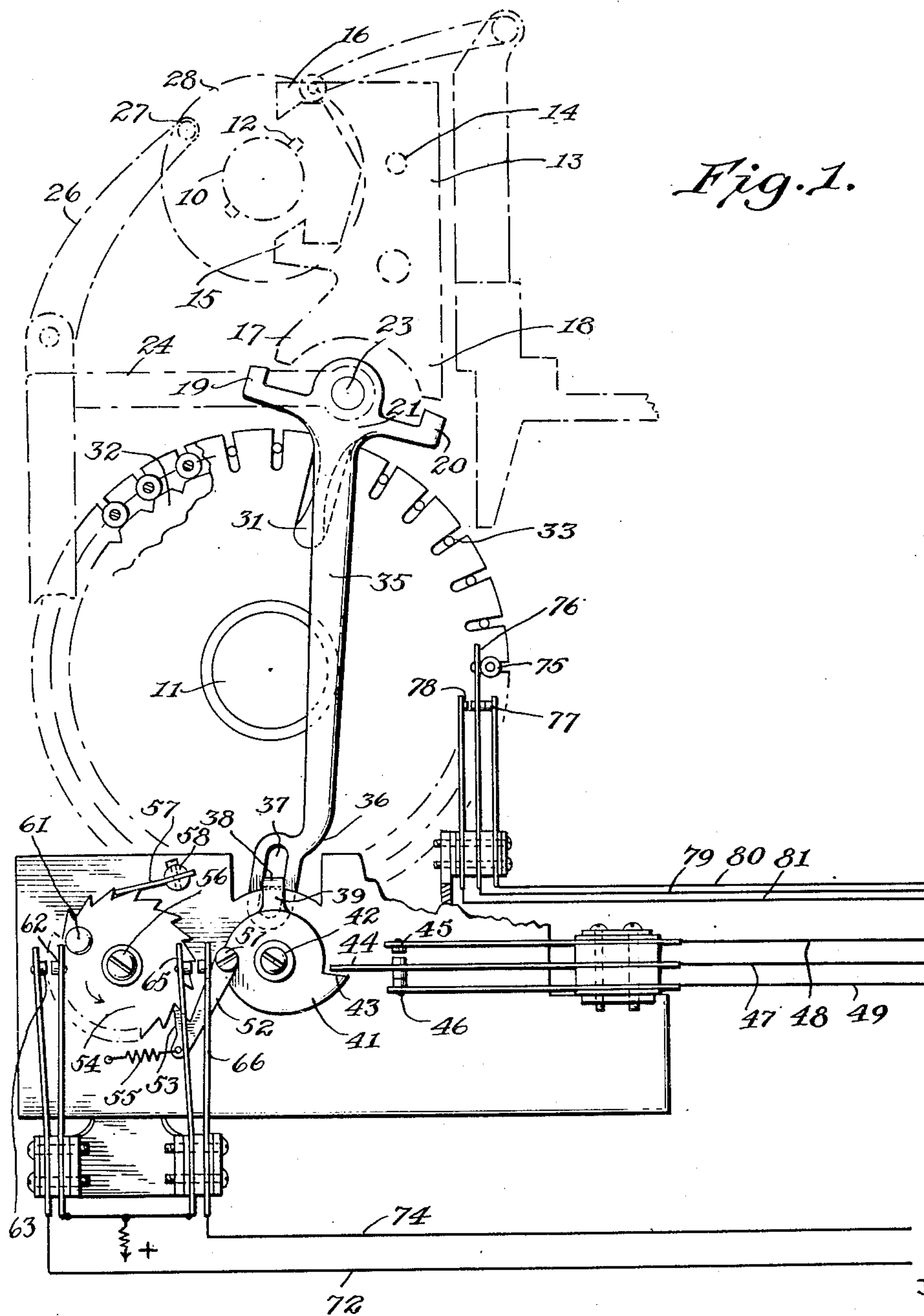
V. R. KIMBALL

1,902,170

DIVIDING RECEIVED INTELLIGENCE INTO TWO OR MORE GROUPS

Filed Oct. 21, 1930

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

Fig. 2.

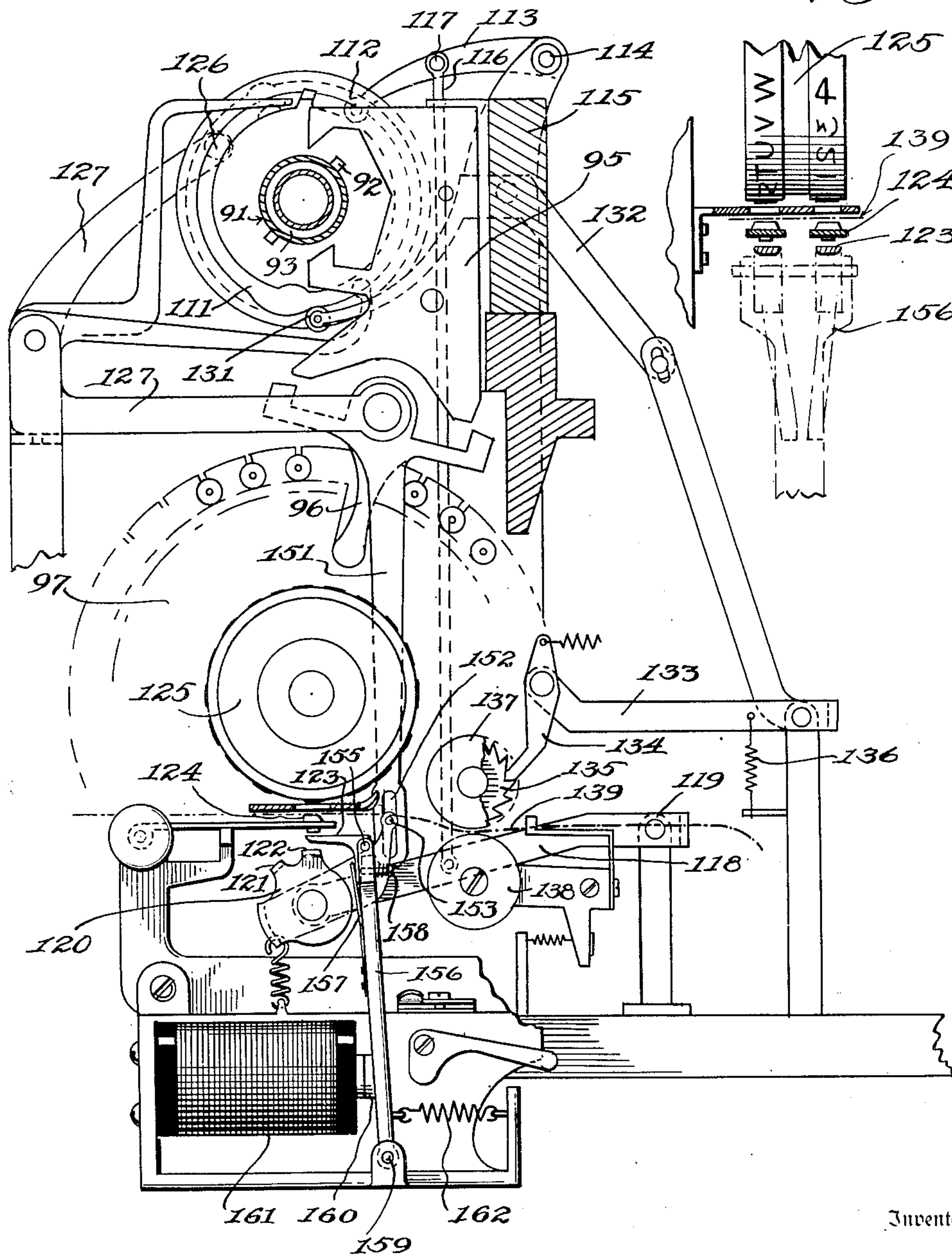
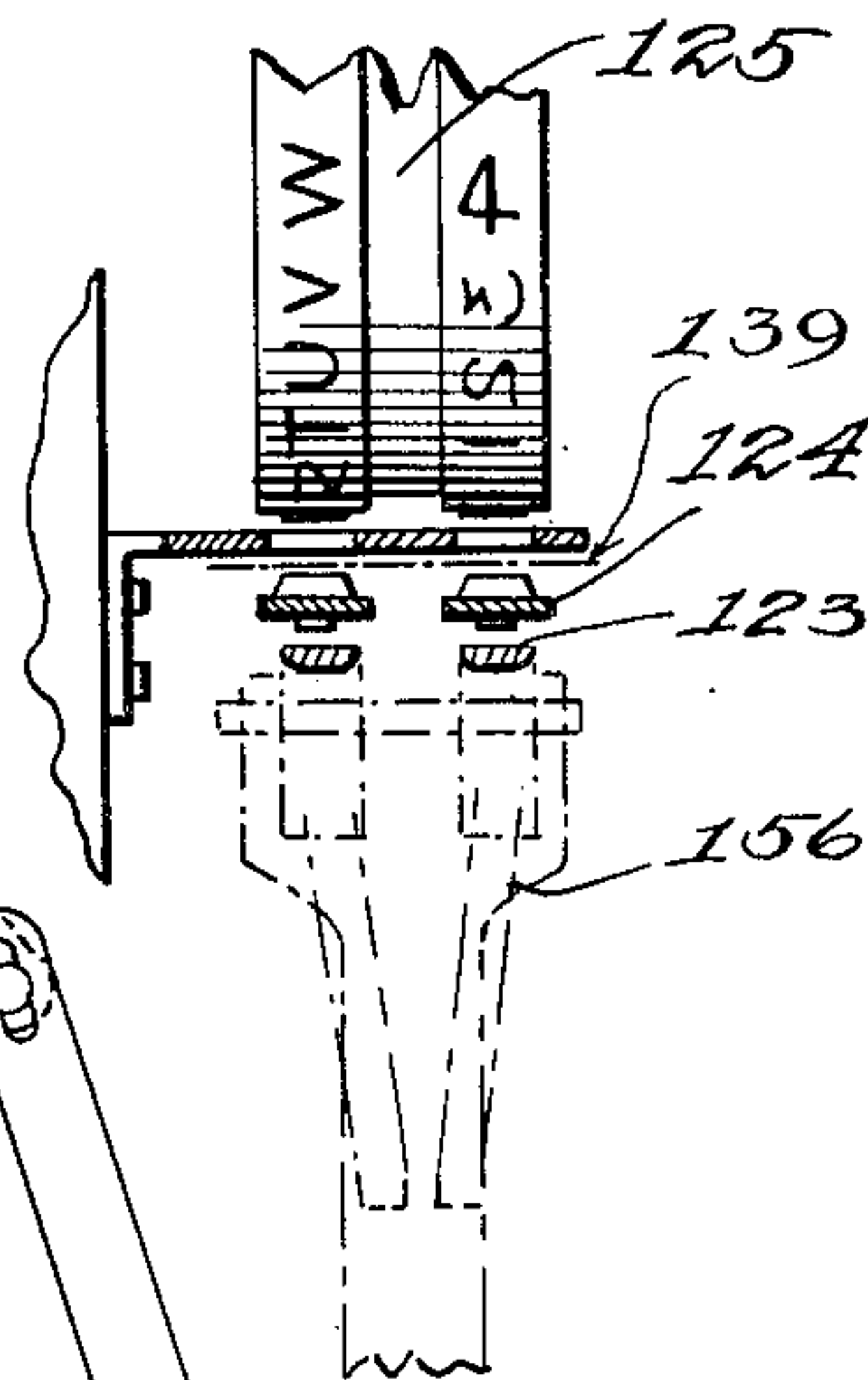


Fig. 3.



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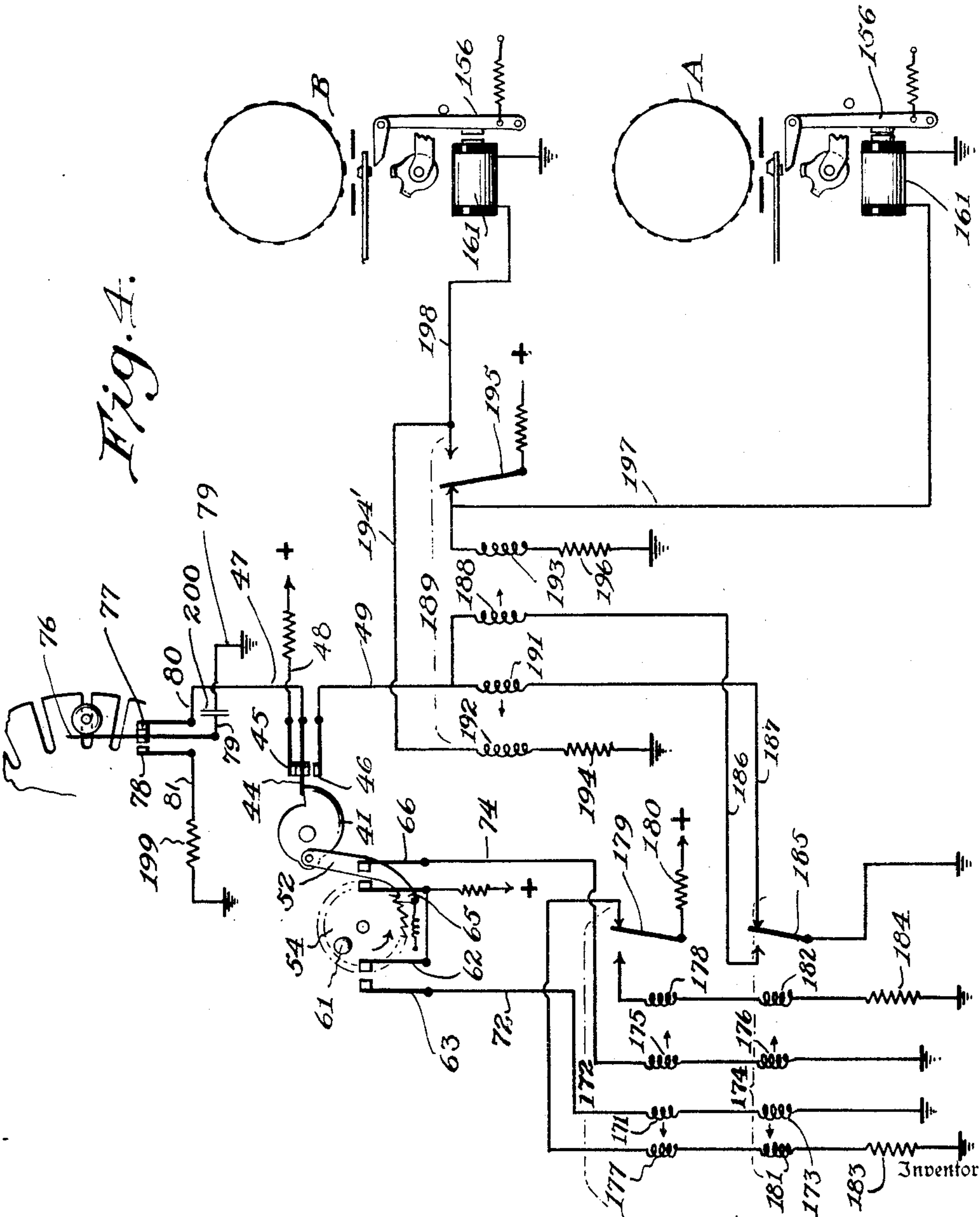
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DIVIDING RECEIVED INTELLIGENCE INTO TWO OR MORE GROUPS

Filed Oct. 21, 1930

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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DIVIDING RECEIVED INTELLIGENCE INTO TWO OR MORE GROUPS

Application filed October 21, 1930. Serial No. 490,261.

My invention relates to signalling systems and especially to high speed telegraph systems such as stock quotation systems.

With the advent of high speed telegraphy 5 for stock quotation systems, it has become necessary, where the received intelligence is to be manually retransmitted, to divide the intelligence into two or more channels or groups, each one being controlled by a separate operator. 10

The separation may be made in accordance with the first letter of each stock designation, a part of the alphabet being allotted to each particular transmitting unit. In other 15 words, should two transmitting elements be used to operate the full brokerage board it is customary for one operator, through his associated mechanism, to send all quotations with stock designations beginning with the 20 letters from A to J and the other to send all stock designations beginning with letters from K to Z.

Heretofore, it has been the practice to have a secondary operator, called an editor, 25 at each operating position who crosses out the stocks which are not to be sent by his particular operator. This method, however, has not proven satisfactory as it requires the services of an extra man, or the editor, and 30 furthermore when the quotations are being received at a very high rate of speed, he may fail to cross out a quotation which should have been crossed out and thereby disconcert the sending operator. Furthermore, 35 the position which he must occupy in order to cross out such stocks obscures the operator's vision for fast retransmission.

Accordingly, an object of our invention is to provide novel apparatus for and methods 40 of, automatically assigning quotations to different operators.

A further object of my invention is to provide novel means for dividing received intelligence which is to be retransmitted into 45 two or more channels.

A stock quotation message consists of a group of letter characters followed by a group of figure characters. In apportioning such messages among two or more operators, 50 it is of course desirable to apportion the re-

ceived intelligence in such a way that the matter assigned to each operator shall consist of a complete quotation.

Still a further object of my invention is to provide novel means for dividing received 55 intelligence into groups of complete quotations in accordance with the number of complete quotations received.

In operating stock tickers, it has been occasionally found necessary to operate a rub- 60 out in order to omit or rub out a quotation which has been incorrectly transmitted.

Accordingly, a further object of my invention is to provide novel means whereby the rubout may be operated without affecting the 65 switching or allotting operation of intelligence to a plurality of operators.

The various features and objects of my invention will be more fully understood upon reference to the following detailed description 70 taken in connection with the accompanying drawings, while the scope of the invention will be particularly pointed out in the appended claims.

In the drawings Figure 1 is a diagram- 75 matic illustration of the master control printer showing a portion of the circuits.

Figure 2 is a diagrammatic view partly in section of one of the receiving printers showing one embodiment of this invention. 80

Figure 3 is a fragmentary side view of the type wheel and sectional view of adjacent cooperating parts.

Figure 4 is a circuit diagram embodying 85 this invention.

Generally, my invention comprises a plurality of reading printers or stock tickers, one for each of the operators assigned to retransmit the received intelligence and a control 90 printer or ticker which will be referred to as the master printer. The master printer apportions the intelligence, or stock quotations in the specific example described, to the different operators. The received quotations 95 are printed by one of the reading printers until the master printer effects a switching operation whereupon that particular reading printer discontinues its printing operation and another printer assumes the printing op- 100

eration from the point where the first printer left off.

As will be fully described hereinafter, this switching operation occurs automatically after the transmission of a predetermined number of complete stock quotation messages.

We will first describe the master printer illustrated in Figure 1. This type of telegraph machine is a modification of a motor driven type wheel tape printer. The operation of the printer is controlled by combinations of marking and spacing impulse conditions transmitted over a telegraph line with which the printer is associated. All of the operations of the printer are determined by the movements of the armature of a polarized magnet actuated in accordance with line impulse conditions.

Specifically, the mechanism of the master printer is operated by a motor through a gearing mechanism (not shown) and which drives the selector cam drum 10 and type wheel shaft 11. The selector cam drum 10 consists of a hollow cylinder with twelve cam lugs or fingers 12 projecting from its outer surface. These lugs 12 are angularly and longitudinally displaced from each other at uniform distances around and along the cam drum 10. Six of these cams 12 are "marking" cams and six are "spacing" cams.

The selector cam drum 10 is slidable longitudinally on the cam drum shaft under control of a polarized magnet (not shown) in a manner described in detail in co-pending application Ser. No. 424,966, filed January 31, 1930.

Associated with each pair of cams 12 is a lever 13 pivotally mounted on a pin 14 about which it may rock. Each lever 13 is provided with jaws 15 and 16 each of which is adapted to be engaged and moved by an individual lug 12 on the cam drum 10 in accordance with the longitudinal position of the cam drum at the instant when the associated lug of one of the jaws is opposite the jaw by reason of the rotation of cam drum 10.

The selector levers 13 are each also provided with two projecting lower arms 17 and 18 which are located above and in alignment with the lugs 19 and 20 of transfer levers 21.

The transfer levers 21, one of which is associated with each of the selector levers 13, are pivotally mounted on a pin 23 carried on an arm 24 which in turn is operated by a bail (not shown) controlled by the operating lever 26. Operating lever 26 carries at its end a roller 27 which rides on the inside of cam 28 as the latter rotates on the motor driven shaft.

The cam 28 is so designed that immediately after all of the selector levers 13 have been set in accordance with a received code combination of impulse conditions, the roller 27 is riding up on the cam and through the lever 26 rocks the transfer bail and lever 24 where-

by the transfer levers 21 are moved towards the selector levers 13. As the transfer levers 21 are moved towards the selectors 13, lug 19 or 20, depending upon the position of the associated selector lever 13, will be engaged by projections 17 and 18 and will accordingly be rocked either clock wise or counter clock wise.

Each of the transfer levers 21 is provided with a projection 31 which extends into a slotted portion of an associated code disk 32. The code disks 32 are mounted for free rotation about the type wheel shaft in the manner described in the application referred to heretofore. Each disk is provided with notches 33 arranged about their circumferential edges.

As the transfer levers 21 are moved into engagement with the selector levers 13 and rocked about their pivots 23 in the manner described above, projections 31 rock the code disks 32 which are rotated either clock wise or counter clock wise, depending upon the angular movement of the transfer levers 21 at this time, and in this manner the setting of the selector levers 13 are transferred to the disks 32.

Attention is directed at this time to the fact that there are six selector and transfer levers 13 and 21, but only five code disks 32. The sixth transfer lever 21 is provided with a depending shift arm 35 in which respect it differs from the other five transfer levers. The lower end of the shift arm 35 is curved as at 36 and provided with a slot at 37 in which the horizontal portion 38 of an angular member 39 plays. The angular member 39 is integral with a cam member 41 mounted for rotation on a pin 42 on which the cam is rocked as the depending shift arm 35 is moved in a manner to be described hereinafter.

The cam 41 has a projecting portion 43 engaging a spring lever member 44 which operates between contacts 45 and 46. The lever 44 and contacts 45 and 46 are connected to conductors 47, 48 and 49, respectively, the extensions of which will be described in more detail in connection with the detailed description of the circuit diagram shown in Figure 4 to be given hereinafter.

Connected at one end of the cam 41 is a pin 51 carrying a pawl 52 having a tooth 53 which is held in engagement with the teeth of a ratchet wheel 54 by means of a spring 55. The ratchet wheel 54 which is rotatively mounted on the pin 56 is prevented from clock wise rotation by a lock lever 57 secured to the printer frame at 58. The ratchet 54 is provided with a horizontally projecting pin 61 which, when the ratchet wheel has reached a predetermined position, engages the spring contactor 62 and moves it into engagement with the spring contact 63. In an angular position 180° displaced from the

first position, the pin 61 engages the spring contactor 65 and moves it into engagement with the spring contact 66. Spring contacts 63 and 66 are connected to conductors 72 and 74, respectively, and spring contacts 62 and 65 are connected in multiple to the positive side of battery, as shown.

As pointed out in the above, upon the setting of disks in accordance with received code combinations of impulse conditions, a stop pin such as 33 drops into the aligned slots. At one of these positions, a special stop pin 75 is provided which is operated in response to a predetermined code combination of impulse conditions. Pin 75 functions as a rubout in case a stock quotation has been incorrectly perforated. With the stop pin 75 in its non-operative position, the spring lever 76 engages the contact 77. When, however, the pin 75 is moved to its operative position, due to an alignment of the disk notches opposite this pin, it will operate the lever 76 to engage the alternate contact 78. Levers 76 and contacts 77 and 78 are connected to conductors 79, 80, 81, respectively, the circuit for which will be described in more detail hereinafter.

In operation, as described in application Ser. No. 424,966 referred to hereinbefore, the cam drum 10 is rotated in timed relation with received code combinations of impulse conditions so that successive pairs of marking and spacing lugs 12 are in operative relation with their associated selector levers 13 as the successive impulse conditions are received. If a marking impulse condition is received, the particular marking cam, at that time in operative relation with its associated selector lever 13, will rock the lever 13 in one direction about shaft 14 and if the spacing condition is received, the spacing lug will rock the selector lever 13 in the opposite direction.

The received code combination of impulse conditions comprises five impulse conditions for selecting the index position of a received character, and a sixth impulse condition which determines whether the selected letter or numeral character is to be printed. This will set the sixth selector lever 13.

In this manner, all the selector levers, including the sixth selector lever are set. Following the setting of the selector levers, the cam 27 rocks the lever 24, which carries the transfer levers 21 towards the selector levers 13. The five transfer levers 21 in turn, through projection 31, rock the disks 32 in accordance with the setting of the selector levers.

Simultaneously, the depending lever 35 is rocked counter-clockwise if the sixth impulse condition is for a letter and clockwise if the sixth impulse condition is a figure. When lever 35 is rocked clockwise, cam 41 rocks counter-clockwise and tooth 53 is moved to engage the next tooth. When now a sixth

impulse letter condition is received, lever 35 rocks counter-clockwise rocking cam 41 clockwise and ratchet 57 is moved through a distance of one tooth.

Inasmuch as each stock quotation comprises a number of letter code combinations followed by a series of numeral code combinations, ratchet wheel 54 is rotated an angular distance of one tooth for each stock quotation message.

After a predetermined number of messages have been received, ratchet wheel 54 will have reached a position at which pin 61 engages contact 62 and moves it to engage contact 63. For each change from letter to numeral code combination, cam 41 is rocked to also move contact 44 between contacts 45 and 46. These operations perform the switching from one to another printer, as will be described in detail hereinafter in connection with the circuit diagram.

Although in the above, the master printer is described as having five selector levers and disks, it will be obvious to those skilled in the art that only the sixth lever and depending lever are necessary except for the rubout selectors.

The printer employed in this invention is disclosed diagrammatically in Figures 2 and 3 in which a tape ticker printer, similar to that shown in Figure 1, is operated from the shaft of a motor (not shown) which is connected through clutch mechanism to a selector cam drum 91. Inasmuch as the two printers are very similar except for some changes to adapt the master printer to its new use, only so much as differs from Figure 1 will be described.

The selector cam drum 91 consists of a hollow cylinder with twelve cam lugs 92 projecting from its outer surface. Six of these cams are "marking" cams and six are "spacing" cams. The rotation of the cam drum 91 and its angular movement is controlled by means of a printing magnet in the manner described in detail in co-pending application 424,966, filed January 31, 1930, by means of which the selector cam drum is slidably moved on the sleeve shaft 93 between two stops. The cams control selector levers 95 which in turn, through transfer levers 96, control selector disks 97 as described in connection with Figure 1.

The operating cam 111 is a combined internal and external cam, the transfer and printing bail levers being controlled by the internal surface and the tape feed bail by the external surface. The operating cam is driven through two clutches by the motor (not shown). One of the clutches initiates the rotation and after the cam has rotated a few degrees, a jaw clutch engages and carries the cam to the end of its revolution.

Shortly after the starting of the rotation of the operating cam 111, the roller 112 at the

end of the printing bail lever 113, which is pivotally mounted at 114 on the frame work 115, rides to the peak of the internal cam, thus lifting the rod 116 which depends from the printing bail lever 113 at 117. The rod 116 is connected at its lower end to the printing bail 118 which is pivotally mounted at 119 to the frame work and carries at its opposite end the printing hammer 120. The printing hammer 120 is provided with two lugs 121 and 122 which extend horizontally, and in opposite directions from each other and cooperate with the inserted members 123 to operate the hammer strikers 124 to press the tape against the type wheel 125.

As the printing bail roller 112 rides down the cam, the roller 126 on the end of the transfer bail lever 127 is riding up on the cam and as it reaches the peak, the transfer bail 127 is rocked to force the transfer levers 96 against the selector levers 95 and the character selection previously set upon the selector levers is transferred to the code disks 97.

While the transfer bail roller 126 is riding to the peak of the internal cam, the roller 131 on the end of the feed bail lever 132 is riding up on the external cam. This motion is transmitted through the lever 132 and rocks the feed bail 133. The feed pawl 134 moves upwards and engages the next tooth of the feed ratchet 135.

Then as the roller on the lever 132 rides down the cam, the feed bail spring 136 moves the feed pawl downwardly, thus stepping the feed ratchet one tooth.

Through the medium of the feed wheel 137 and the pressure roller 138, the tape 139 moves forward one letter.

As in the case of the master printer, the sixth selector lever controls a depending lever 151, which is provided with a slot 152 in which a pin 153 moves and rocks the printer mechanism 120 to condition the printer for letter or numeral printing in accordance with the sixth pulse condition.

The interposed members 123 are pivoted at 155 to the arm 156 and held in position by a leaf spring 157 and screw controlled spring 158. The arm 156 is pivoted at 159 and provided with an armature 160 which cooperates with the core of the electromagnet 161. A spring 162 engages the lower end of the lever member 156 and normally holds it in its non-operative or deenergized position.

As will now be obvious, when the magnet 161 is energized and moves the member 156 to the position shown, the interposed members 123 assume the position shown and when the printing lugs 121 and 122 are operated in the manner described above, the striker 124 will be engaged and will press the tape against the type wheel.

When, however, the magnet 161 is deenergized and the arm 156 is retracted into its non-operative position, interposed members 123

are withdrawn from between the lugs 121 and 122 and the striker 124, so that even though the lugs are moved for the printing operation, this movement is insufficient to cause the striker 124 to be moved against the tape. In this manner, a printer may be maintained in either non-operative or operative position, as desired.

Referring now to the circuit diagram shown in Figure 4, the conductor 72 is connected to the winding 171 of the relay 172 and in series with the winding 173 of the relay 174. The conductor 74 is connected to the winding 175 of the relay 172 and in series with the winding 176 of the relay 174. Relay 172, in addition to the winding 171 and 175, is provided with the locking windings 177 and 178 connected to opposite contacts between which the relay armature 179 operates. Armature 179 is connected to the positive side of the battery through a resistance 180. Winding 171, when energized, throws armature 179 to its left hand contact where locking winding 178 holds it locked. Winding 175 throws the armature to its right hand contact where it is held locked by winding 177. It will be understood that the electromagnetic actions of windings 171 and 175 are sufficiently larger than the locking windings to overcome the effect of the latter.

The relay 174, in addition to the windings 176 and 173, is provided with locking windings 181 and 182 connected in series with locking windings 177 and 178, respectively, and grounded through resistances 183 and 184, respectively. Relay 174 controls an armature 185 which operates between two contacts connected to conductors 186 and 187, respectively. Windings 173 and 182, throw armature 185 to its left hand contact and windings 176 and 181 throw the armature to its right hand contact. Windings 173 and 176 overcome the effect of windings 181 and 182.

Conductor 186 is connected to the winding 188 of the relay 189 and the conductor 187 is connected to the winding 191 of the relay 189. Relay 189, in addition to the windings 188 and 191, is provided with locking windings 192 and 193. The locking winding 192 is connected to ground at one terminal through the resistance 194 and at its other terminal is connected over conductor 194' to one contact of armature 195. The winding 193 is connected through a resistance 196 to ground and at its other terminal to the other contact between which the armature 195 operates. Winding 191 throws armature 195 to its left and winding 188 throws the armature to its right. These windings overcome the effect of the locking windings.

In multiple with the winding 193 is a conductor 197 connected to the magnet 161 which controls the member 156 of printer A. In multiple with the conductor 194' is the

conductor 198 connected to the magnet 161 of a second printer B.

The windings 188 and 191 are connected together and over conductor 49 to one contact 46. The contactor 44 is connected over conductor 47 to conductor 80 connected to the contact 77 of the rubout contacts. The other contact 78 of the rubout contacts is connected through a resistance 199 to ground, while the contactor 76 is connected through a condenser 200 to ground.

As described above, each time the cam 41 is rocked about its pivot, the pawl 52 operates the ratchet 54 through a distance of one tooth for each change from "figures" to "letters". After the receipt of a predetermined number of groups of figures and letters comprising the predetermined number of stock quotations, the pin 61 will engage the contactor 62, causing it to engage contact 63 and a circuit is thereupon completed for the relay windings 171 and 173.

As a result of the energization of the winding 171, armature 179 is moved to engage its left hand contact and a locking circuit is thereupon completed for the windings 178 and 182 in series. Current through winding 173 moves armature 185 to its left hand contact.

The current through the winding 178 will now maintain armature 179 in engagement with its left hand contact and the current through the winding 182 will maintain its armature 185 in engagement with its left hand contact. As a result of the armature 185 being in engagement with the left hand contact, a circuit is prepared with winding 188 of relay 189, but this circuit is still held open at this instant since the last movement of the ratchet 54 occurred while a figures code combination is being received and the contactor 44 is accordingly in engagement with the contact 45.

At the end of the receipt of the last figure, and the beginning of the first letter of the next code combination of the stock quotation, the member 44 will move to engage contact 46 and the energizing circuit for the relay winding 188 is completed over conductor 49, contact 46, conductor 47, contact 77, and contactor 76, through condenser 200 to ground. Inasmuch as the condenser 200 was previously charged while the contactor 44 was in engagement with the contact 45, it will now discharge itself over the above described circuit. Relay 188 is momentarily energized and operates armature 195 to engage its right hand contact, completing an energizing circuit for the electromagnet 161 of printer B. Electromagnet 161 will thereupon operate the member 156 and render its associate printer operative. The magnet 161 of the printer A is at this time de-energized and its member 156 is thereupon in its de-energized position

at which position its associate printer is in a non-operative condition.

The above condition, with printer B operative and A non-operative, is now maintained until the pin 61 engages contact 65 whereupon an energizing circuit is completed for the winding 175 which is sufficient to overcome the locking circuit through the winding 177 and throw the armature 179 to its right hand contact. A circuit in series with the winding 175 which is completed for the winding 176, is also sufficient to throw its armature 185 to its right hand contact. Armature 185 in engagement with its right hand contact completes an energizing circuit for the winding 191 which thereupon throws its armature 195 to its left hand contact.

The magnet 161 of printer B is de-energized and the magnet 161 of printer A is energized. As in the previous case, however, the energized circuit for the winding 191 is completed only when the receiving code combination changes from figures to letters and the member 44 moves to engage its contact 46.

As has been explained, the rubout pin and the control contact 76 does not effect the switching operations described above. This will be seen from the following:

It will be assumed for the purpose of illustration, that no rubout is received. Then the lever 76 remains in engagement with contact 77 and the condenser 200 is charged while the figures code combinations of impulse conditions are being received. This charge on the condenser 200 discharges through the windings 188 and 191 in the manner described above.

It will now be assumed that the letters are being received and that the rubout is received during the letters operation. The lever 35 is then swung to the figures position and the contactor 44 engages contact 45. Simultaneously, however, lever 76 moves to engage contact 78. Condenser 200 thereupon discharges through the resistance 199 in the event that any charge collects thereon by reason of the fact that the lever 44 engaged contact 45 before the lever 76 disengaged contact 77.

On the reception of the following character after the rubout lever 76 has engaged contact 78, lever 44 will engage contact 46, but inasmuch as the circuit is at this time open at contact 77, no current will flow through any of the windings of relay 189. Accordingly, no change in printer operation will be effected so that the rubout may be sent within a group of letter characters without effecting a change of one printing unit to the other.

It will be assumed on the other hand, that the rubout is received during the reception of a group of figure code combinations. The lever 44 will then be engaging contact 45 and the condenser 200 is charged. When the lever 76 moves to engage contact 78, condenser 200

discharges, only to be charged again when the lever 76 again engages contact 77. The circuit for the windings of relays 189 is, however, still open at lever 44 and accordingly, no energizing circuit is completed for the windings of relay 89. Thus the effect of a rubout in a group of figure characters does not effect a change of one printing unit to the other.

Should a rubout be received at the end of a group of figure characters just proceeding a group of letter characters, the reception of the rubout will cause the condenser 200 to discharge through the resistance 199 and therefore have no effect on the windings 191 and 188. This will result in the mechanism waiting until the next shift from figures to letters has been effected before switching from one ticker to another.

Although I have illustrated my invention in connection with switching operations for a stock quotation system, it will be obvious, to those skilled in the art, that the invention has other adaptations and I do not want to limit myself to this specific illustration.

Furthermore, although we have chosen a particular stock ticker for effecting the switching operation, it will be understood that a ticker is shown merely by way of illustration and that the switching may be accomplished with other mechanism than that shown.

I claim:

1. In a unit message system in which each message comprises characters from different groups, switching mechanism, counting means for operating in response to a change in the group of the received characters, and means responsive to said counting means for operating said switching mechanism.

2. In a unit message system in which each message comprises letter and figure characters, switching mechanism, counting means responsive to a change in the character from figures to letters and letters to figures whereby the number of received messages is counted, and means responsive to said counting means for operating said switching mechanism.

3. In a unit message system in which each message comprises characters from different groups, switching mechanism, counting means for operating in response to a change in the group of the received characters, means responsive to said counting means for operating said switching mechanism, a plurality of registers for receiving said messages, means whereby only one of said registers is operative at one time, and means whereby said switching mechanism switches from the one to another of the registers.

4. In a unit message system in which each message comprises characters from different groups, switching mechanism, counting means for operating in response to a change

in the group of the received characters, means responsive to said counting means for operating said switching mechanism, a plurality of registers for receiving said messages, means whereby only one of said registers is operative at one time, and means whereby received switching mechanism renders said operative register non-operative and renders another of said registers operative.

5. In a unit message system in which each message comprises characters from different groups, switching mechanism, counting means for operating in response to a change in the group of the received character, means responsive to said counting means for operating said switching mechanism, a plurality of repeaters for receiving said messages, means whereby only one of said repeaters is operative at one time, means whereby received switching mechanism renders said operative repeater non-operative and renders another of said repeaters operative, means responsive to received rubout characters, and means whereby said rubout characters do not affect said switching mechanism.

6. In a unit message system in which each message comprises characters from different groups, switching mechanism, counting means for operating in response to change in group of the received characters, means responsive to said counting means for operating said switching mechanism, a plurality of registers for receiving said messages, means whereby only one of said registers is operative at one time, and means including circuit connections controlled by said switching mechanism for switching from one to another of said registers.

7. In a unit message system in which each message comprises characters from different groups, switching mechanism, counting means for operating in response to change in group of the received character, means responsive to said counting means for operating said switching mechanism, a plurality of registers for receiving said messages, means whereby only one of said registers is operative at one time, means including circuit connections controlled by said switching mechanism for switching from one to another of said register devices, means whereby said register devices receive rubout characters, and means including circuit connections whereby said rubout has no effect on the switching mechanism.

8. In a unit message system in which each message comprises a group of characters, a plurality of registers, a switching mechanism, and means automatically responsive to a predetermined number of received messages for operating said switching mechanism.

9. In a unit message system in which each message comprises a group of characters, a plurality of registers, a switching mechanism, means automatically responsive to a

predetermined number of received messages for operating said switching mechanism, and means controlled by said switching mechanism for rendering one of said registers operative to receive the messages.

10. In a unit message system in which each message comprises a group of characters, a plurality of registers, a switching mechanism, means automatically responsive to a predetermined number of received messages for operating said switching mechanism, means whereby one of said registers is operative to receive the messages, and means controlled by said switching mechanism for rendering said operative register non-operative and rendering another of said registers operative.

11. In a unit message system in which each message comprises a group of characters, a plurality of registers, a switching mechanism, means automatically responsive to a predetermined number of received messages for operating said switching mechanism, means whereby one of said registers is operative to receive the messages and means controlled by said switching mechanism for switching from said one to another of said registers for receiving said messages.

12. In a unit message system in which each message comprises a group of characters, a plurality of registers, a switching mechanism, means automatically responsive to a predetermined number of received messages for operating said switching mechanism, and circuit means controlled by said switching mechanism for rendering one of said registers operative to receive the messages.

13. In a unit message system in which each message comprises a group of characters, a plurality of registers, a switching mechanism including circuit connections, means automatically responsive to a predetermined number of received messages for operating said switching mechanism, means whereby one of said registers is operative to receive the messages, and means controlled by said switching mechanism for rendering said operative register non-operative and rendering another of said registers operative.

14. In a unit message system in which each message comprises a group of characters, a plurality of registers, a switching mechanism, means automatically responsive to a predetermined number of received messages for operating said switching mechanism, means whereby one of said registers is operative to receive the messages, means controlled by said switching mechanism for rendering said operative register non-operative and rendering another of said registers operative, and means whereby a received rubout code combination does not effect said switching mechanism.

15. In a unit message system in which each group of characters comprises a complete message, a plurality of printers of which certain are held operative while the others are

non-operative, a switching mechanism comprising a master printer, means controlled by said printer, and circuit connections controlled by said means for rendering one of said printers operative and the other non-operative and vice versa.

16. The method of dividing received intelligence in a telegraph system which consists in directing messages in a predetermined channel, counting the number of messages so directed, and automatically switching the messages to a different channel after a predetermined number of messages have been directed to the first channel.

17. The method of dividing received intelligence in a telegraph system which consists in directing messages in a predetermined channel, counting the number of messages so directed, and automatically switching the messages to a different channel solely in accordance with the number of messages directed to the first channel.

18. In a recorder, a plurality of characters, a record sheet, means for selecting a character to be printed, a printing hammer, means for actuating said hammer, means to render said hammer ineffectual to print when actuated, and means to render it effective.

19. In a telegraph printer, a typewheel, a tape, a printer hammer for pressing said tape against said typewheel, means to restrain the operation of the hammer, and electromagnetic means to render the operation of the hammer effectual.

20. The method of dividing received intelligence in a telegraph system which consists in automatically directing the intelligence into one or another predetermined channels determined solely by the number of messages.

In testimony whereof I affix my signature.
VERNON R. KIMBALL.