

No. 867,900.

PATENTED OCT. 8, 1907.

J. C. BARCLAY.
TELEGRAPH TRANSMITTER.
APPLICATION FILED MAR. 24, 1905.

3 SHEETS—SHEET 1.

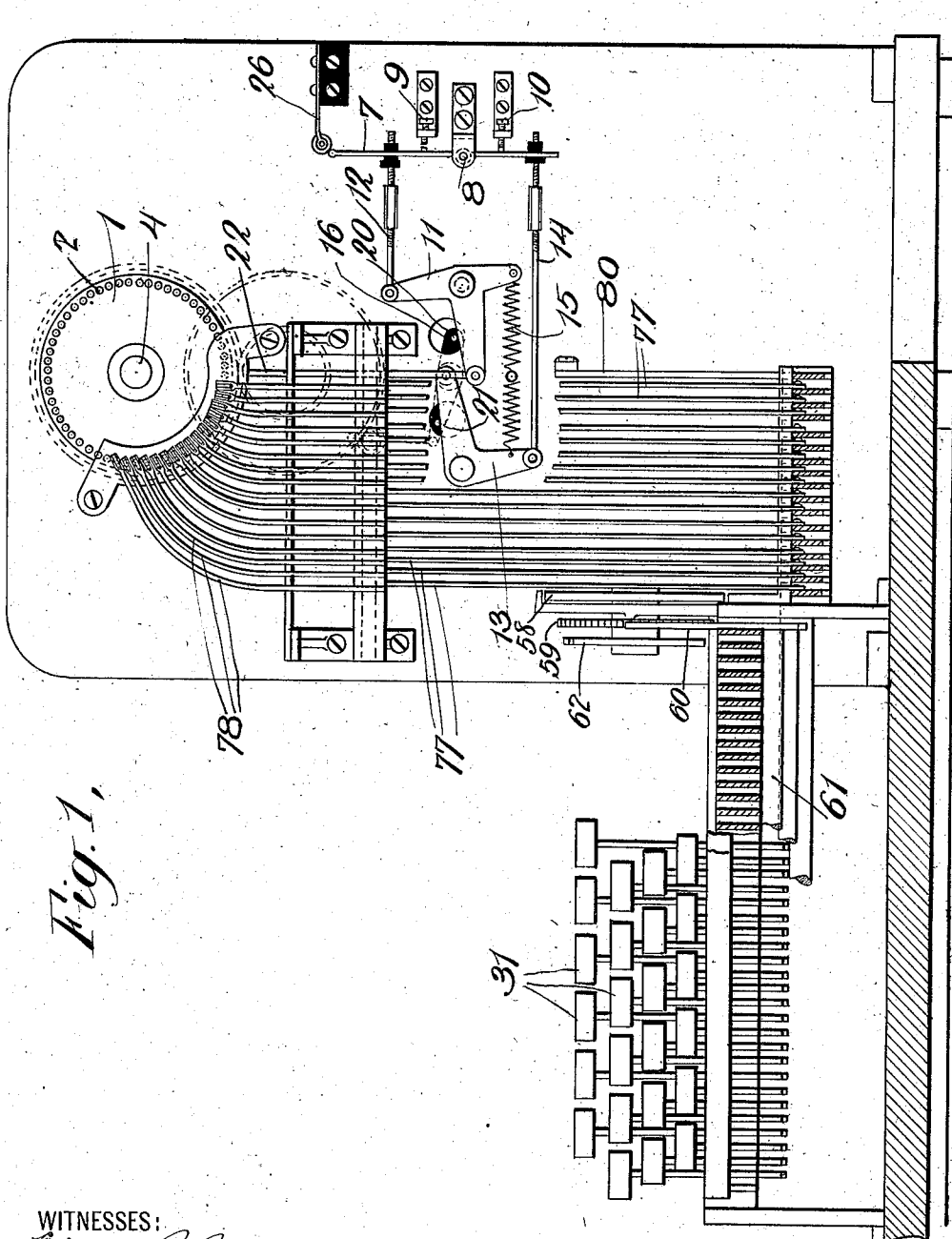


Fig. 1.

WITNESSES:

Benjamin P. Burnett
L. S. Andrews Jr.

INVENTOR

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H. M. Marshall

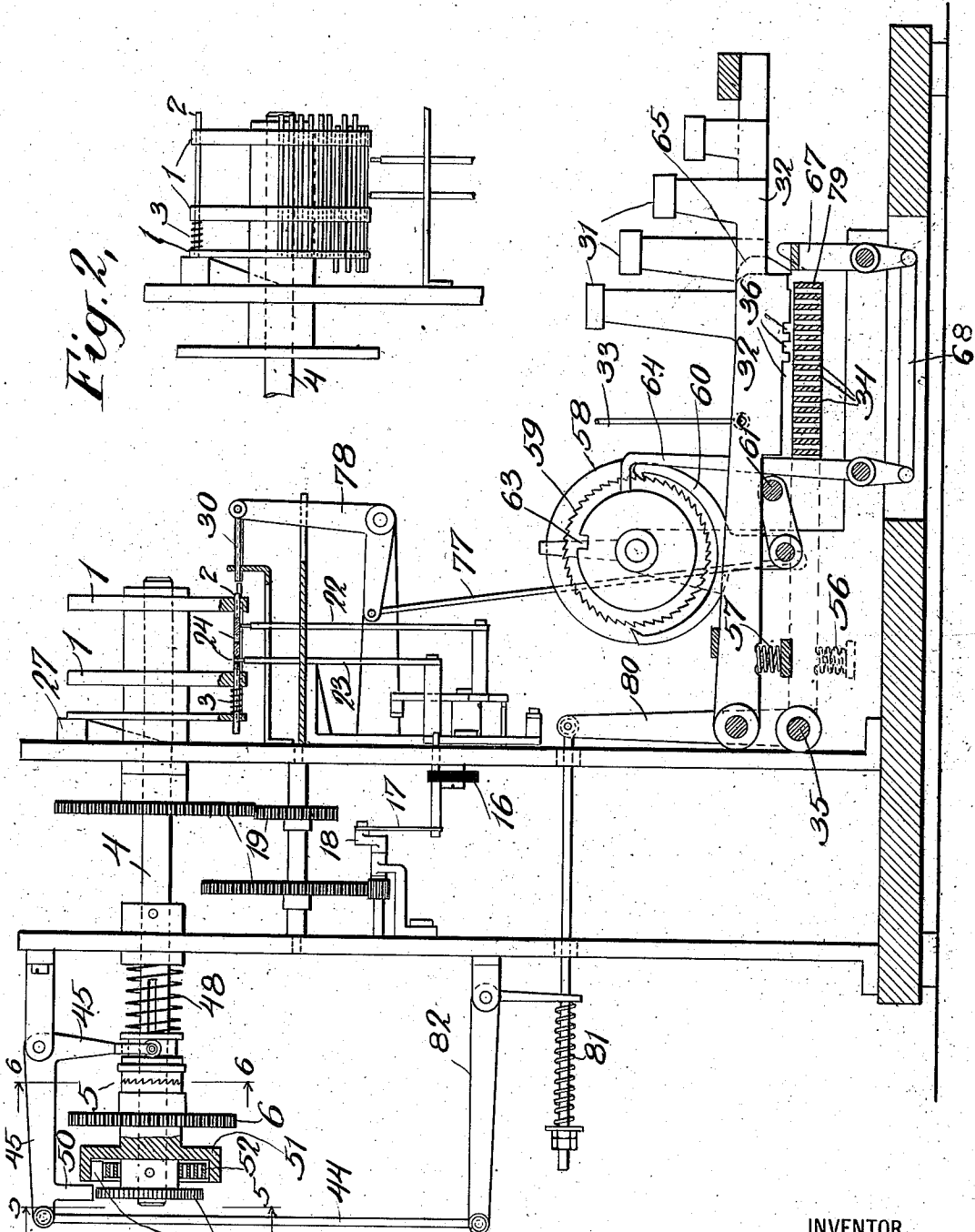
ATTORNEY

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3 SHEETS—SHEET 2.



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Fig. 3.

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3 SHEETS—SHEET 3.

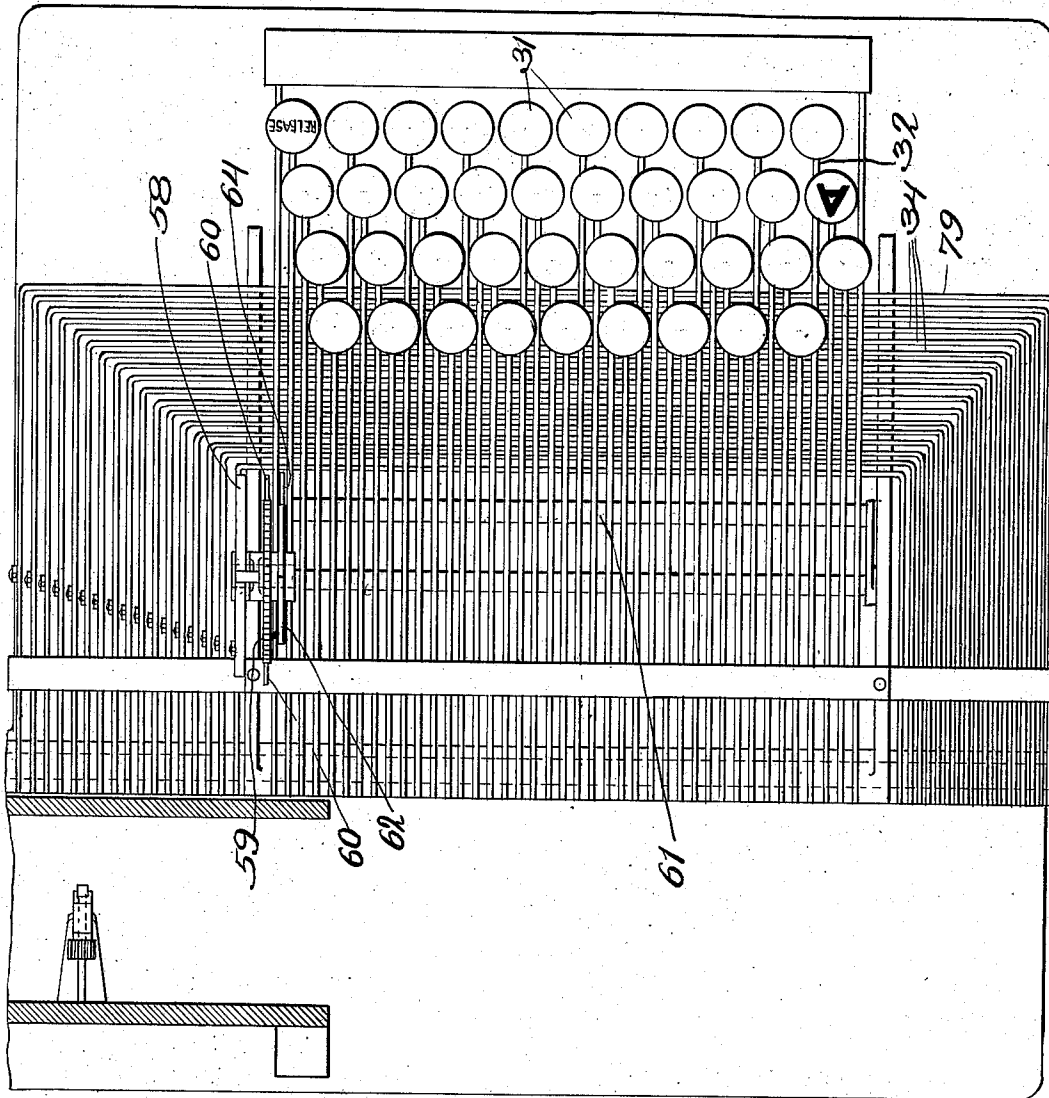


Fig. 4,

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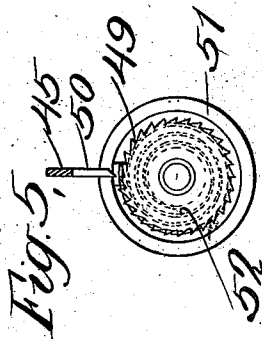


Fig. 5,

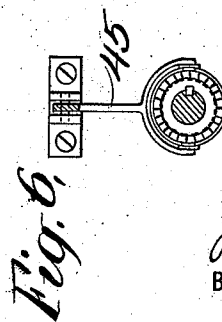


Fig. 6,

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UNITED STATES PATENT OFFICE.

JOHN C. BARCLAY, OF NEW YORK, N. Y., ASSIGNOR TO WESTERN UNION TELEGRAPH COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

TELEGRAPH-TRANSMITTER.

No. 867,900.

Specification of Letters Patent.

Patented Oct. 8, 1907.

Application filed March 24, 1905. Serial No. 251,803.

To all whom it may concern:

Be it known that I, JOHN C. BARCLAY, a citizen of the United States, residing in New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Telegraph-Transmitters; and I do hereby declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the same.

- 10 My invention relates to improvements in telegraph transmitters, and particularly to improvements in keyboard telegraph transmitters wherein a series of keys marked according to the various characters to be transmitted telegraphically are arranged to operate means whereby, when each key is operated, the corresponding character is transmitted.

- 15 The particular key-board transmitter herein illustrated is particularly intended for use in connection with a page-printing telegraph printer, such for example as illustrated and described in my Patent No. 787,608, dated Apr. 18, 1905; but my invention is not limited to use in connection with printing telegraphs, or to any particular code of transmission, but is applicable for telegraphic transmission generally, and may transmit according to any code desired.

- 20 My improved keyboard telegraph transmitter herein illustrated and described comprises a plurality of adjustable stops or circuit-controlling devices, adjustably mounted in a moving carrier, and arranged to be adjusted in position, according to the character to be transmitted, so as to represent physically that character; and the transmitter further comprises contact mechanism arranged to be operated variably according to the variable adjustment of said stops or circuit-controlling devices, so as to transmit the different signals.

- 25 My invention consists in novel and improved means, as hereinafter described, for operating the transmitting contact mechanism variably according to the character to be transmitted, and in many other features of invention hereinafter more particularly described and pointed out in the claims.

- 30 The objects of my invention are, to improve and simplify keyboard telegraph transmitters; to render the same certain and rapid in operation; to adapt the same for the employment of approved types of transmitting contact mechanism; to avoid unnecessary delay between characters transmitted; and to make the machine easy to operate, easy to inspect and keep in order, simple, rapid in operation, and relatively inexpensive.

- 35 I will now proceed to describe my invention with reference to the accompanying drawings, which illustrate one embodiment thereof, and will then point out the novel features in claims.

- 40 In the said drawings;—Figure 1 shows a front view and partial section of the transmitter, a portion of the

keyboard being broken away. Fig. 2 shows a detail side view of the revolving carrier and adjustable stops or circuit-controlling devices of said transmitter, part of the stops being omitted. Fig. 3 shows a side view and partial section of the transmitter; Fig. 4 shows a top view of the keyboard and associated parts of the transmitter, the contact mechanism and associated parts being omitted. Fig. 5 is a detail end view and partial section on the line 5—5, Fig. 3, showing the locking ratchet 49 and associated parts. Fig. 6 shows a detail section of the clutch through the line 6—6 of Fig. 3.

Referring now to the drawings, numeral 1 designates a revoluble drum, or carrier, provided, near its periphery, with a circular row or series of adjustable stop or circuit-controlling devices, 2, arranged longitudinally, and each surrounded by a light spiral spring, 3, the only function of which is to retard slightly, by friction, longitudinal motion of the stop.

Drum 1 is arranged to be rotated, being mounted upon a shaft 4, arranged to be driven, through a clutch 5, by a gear wheel 6. Any suitable means may be employed for driving gear 6, such as an electric motor, a weight, a spring, etc. I do not illustrate, and do not limit myself to, any particular type of motor for the purpose.

The contact mechanism, for transmitting the signals, which I prefer to use, is similar to that of the well known Wheatstone automatic transmitter, but is not controlled by a perforated tape, as in the Wheatstone instrument, the drum 1 and its stops serving in lieu of a perforated tape. Said contact mechanism, shown particularly in Figs. 1 and 3, comprises a pivoted contact arm, 7, pivoted at 8, and arranged to make contact alternately with stops 9 and 10. These stops, and the central pivot 8, constitute circuit terminals; and these circuit terminals, with the contact arm 7, will be recognized as constituting a familiar arrangement of contact points commonly employed in polar transmitters used with dynamo currents.

For vibrating the pivoted arm 7, bell-cranks 11 and 13, connected by adjustable links 12 and 14 to opposite sides of arm 7, are provided. Links 12 and 14 have sliding connections with contact arm 7, permitting some lost motion. Springs 15 act upon the bell-cranks, tending to cause each bell-crank to move the contact arm 7 toward the corresponding contact stop, 9 or 10. Motion of the bell-cranks is produced, however, by the action of a vibrating rocker, 16, arranged to be rocked by a link 17 and crank 18, the latter driven by suitable gearing 19 from shaft 4. Said rocker carries pins 20 and 21, engaging arms of the bell-cranks 11 and 13, as shown; the rate of oscillation of rocker 16 being the same as the rate of passage of the stops 2 past a given point, during the rotation of drum 1.

Each time the right-hand end of rocker 16 rises,

spring 15 tends to cause bell-crank 11 and link 12 to move contact arm 7 into contact with stop 9; and each time the left-hand end of rocker 16 rises, spring 15 tends to cause bell-crank 13 to move contact arm 7 into contact with stop 10. The movement of the bell-cranks and contact arm 7 is determined by the adjustment of the stops 2, through the agency of pins 22 and 23, carried by bell-cranks 11 and 13 respectively, and guided so as to move substantially vertically. The ends of these pins are just beneath the stops 2. Each of such stops is provided with recesses 24, and as the rotation of the drum 1 brings the stops successively over pins 22 and 23, either pin 23 or pin 22 will be in registry over said pins, according as the said stop is in its normal position or has been pressed inward. Neither pin 22 nor pin 23, can rise enough to effect a change in the position of contact arm 7, unless a recess 24 is in registry, so that it may move up into said recess. In other words, in the normal adjustment of stops 2, pin 22 cannot rise materially during the reciprocation of the carrier 16, and therefore, contact arm 7 is stationary, normally, in the position indicated in Fig. 1, in contact with stop 10; while on the other hand, pin 23 is normally free to rise, since normally all of the stops, as they pass over the pins 22 and 23, have each a recess 24 in registry with pin 23. But when, as pin 22 starts to rise, the stop 2 opposite the end of such pin at that instant has been pressed in, so that one of its recesses 24 is in registry, said pin 22 continues to rise, causing the contact arm 7 to shift into contact with stop 9, so initiating a signal. If only one stop has been pressed in, then when rocker arm 16 causes pin 22 to move downward, upward motion of pin 23 will be permitted, a recess 24 of the next adjacent stop 2 being above said pin, and pin 23 will rise, moving contact arm 7 back into contact with stop 10, and terminating the signal, which will thus be of minimum length—viz., a dot; but if say three adjacent stops 2 have been pressed in, at its first attempt pin 23 will be prevented from rising; and it will not be until the fourth stop, counting from the first stop pressed in, is opposite pin 23 that the latter can rise and reverse the position of contact arm 7. It will be obvious therefore, that when three adjacent stops are pressed in, the contact arm 7 remains in contact with stop 9 longer than when only one stop is pressed in. Similarly, if five adjacent stops are pressed in, a still longer signal will result.

It is not essential that a single stop 2 pressed in shall represent a dot, and three stops pressed in shall represent a dash; a plurality of stops, as for example three, may be employed to transmit a dot, and a still higher number a dash; and the dashes, and the intervals between the dots and dashes, may be of varying lengths. It will be noted that the stops 2, when adjusted to produce the dots and dashes of a character of a telegraphic code, in effect constitute a physical representation of that character.

A jockey 26 tends to hold contact arm 7 in either of its extreme positions, and so overcomes the tendency of the friction of links 12, when sliding through the contact arm, to shift said arm improperly.

The drum 1 is shown as provided with more stops or circuit controlling devices 2 than will be required for any one character of any of the telegraph codes commonly used. All of the stops required for any one

telegraph character are adjusted simultaneously, by means directly actuated by the key-levers; and while the stops are being adjusted in position to make the desired character, the rotation of the drum 1 is stopped momentarily through the opening of the clutch 5 and the operation of locking means hereinafter described. As soon as the adjustment of the stops is complete, the rotation of the drum 1 begins again, and as the stops of the character to be transmitted pass the pins 22 and 23 they control the upward movement of said pins and the oscillation of the contact arm 7 in such manner as to cause the transmission of the character represented by the adjustment of the stops. After each stop passes the pins 22 and 23 it encounters a resetting cam 27, by which all of the stops which have been pressed in or back are pressed out again, and are thus prepared to be adjusted for another character.

In the transmitter herein illustrated, I employ for setting the stops 2, a key-board provided with suitable selecting mechanism and with mechanical connections to pushpins 30 suitably guided and arranged in the arc of a circle opposite the ends of stops 2. Numerals 31 designate the said keys, and 32 the key-levers. The finger keys may be marked the same as the keys of a typewriter, each with the particular letter or character to which it corresponds; in fact, key-levers 31 and 32 may be the key-levers of a typewriter, being provided with connections, such as 33, for operating the printing and other mechanism of a typewriter in the ordinary manner. I do not illustrate the mechanism of any type-writer, other than the keys, key-levers and connections 33, as such mechanism forms no portion of my invention, and the selecting mechanism herein illustrated and described may be operated in the manner illustrated by the key-levers of most if not all of the well-known typewriters.

Beneath the key-levers 32 are a plurality of bails 34, pivoted at 35; and the key-levers are provided with a plurality of notches, 36, corresponding in position to the bails 34 which said key-levers are not to actuate when depressed. Each key-lever is notched differently from all of the others, and therefore each key-lever when depressed, actuates a characteristic combination of bails 34. These bails 34 are connected by links to bell-cranks 78. The upper arms of these bell-cranks are curved, as shown in Fig. 1, so that their ends are in an arc of a circle approximately concentric with the axis of drum 1; and these ends are connected to the push-pins by which the stops 2 are pressed in.

For operating the clutch 5, through which the drum 1 is driven, a master-bail 79 is provided. This bail actuates a lever 80, which has a yielding connection, through a spring 81, with a bell-crank 82 connected by link 44 with the clutch-operating lever 45. To arrest the rotation of shaft 4 when the clutch is opened, a locking disk 49, fast to shaft 4, is provided; and lever 45 is provided with a tooth 50 arranged, when said lever is depressed to open the clutch, to enter one of the various notches in said locking disk and arrest and center the drum 1. To aid in bringing the drum 1 to rest in proper position, and to insure that it shall remain steady until shaft 4 is released and the clutch 5 closed, I further provide a friction drag, consisting of a flanged disk 51, driven by gear 6, and a spring 52, within the flange of said disk, one end of said spring

secured to shaft 4, the other carrying a pad 53 which is pressed by said spring against the flange of disk 51.

When one of the key-levers is depressed and with it the appropriate combination of selecting bails 34 and master-bail 79, spring 81 through which the motion of that master-bail is transmitted to lever 45, which spring is of sufficient stiffness to overcome the clutch spring 48, communicates motion to lever 82 and clutch-lever or lock-lever 45, opening the clutch and stopping the drum 1. This occurs before any of the selecting bails 34 have been depressed. As the key-lever is depressed further, the appropriate selecting bails 34 are depressed (the spring 81 compressing to permit further motion of the key-lever after locking tooth 50 has reached the limit of its movement) and the corresponding push-pins 30 are pressed in, pressing in the corresponding stops 2. When the finger key is released, the push-pins 30 are first withdrawn, and then the lever 82 is permitted to rise, the tooth 50 clearing the locking disk 49 and the clutch 5 closing. When any finger key, after being so depressed, is released, the corresponding key-lever, and with it the selecting bails and the master-bail, which have been depressed, are returned by suitable springs, such as 56 and 57.

When my improved transmitter is to be used in connection with printing telegraphs of the page-printing type, as for example the printing telegraph illustrated and described in my Patent No. 787,608, I employ means for indicating when the end of the line is approached, so that the transmitting operator may operate the release or carriage-return key at the proper time. The indicating means for this purpose illustrated in the drawing consists of a wheel 58, upon the periphery of which may be any suitable scale or marks to indicate the position of the carriage of the receiving printer, and a mark to indicate the end of the line. This wheel is rotated by a ratchet wheel 59, connected to it, and arranged to be rotated step by step, as the keys are operated successively, by a ratchet 60 operated by a universal bar 61 which is beneath the key-levers and is depressed by each such lever when the latter is actuated. A locking disk 62, likewise driven with the ratchet wheel, is provided with a notch 63 which a locking lever 64 enters when the end of the line is reached, thereby locking the keys; for since the ratchet wheel 59 cannot move when the disk 62 is so locked, neither can the ratchet 60 and the universal bar 61; and the latter holds the key-levers from being depressed.

The return of the carriage of the receiving printer is accomplished by the depression of a key, marked "Release" in the representation of the key-board, Fig. 4. Such key is arranged, when depressed, to operate a corresponding combination of selecting bails 34 as do the other keys of the key board. This release key is provided with a projection 65 (Fig. 1) which encounters a lever 67 and presses it aside before said release key, or more properly the key lever thereof, encounters the universal bail 61. The lever 67, when so pressed aside, operates locking lever 64 through a link 68, releasing the disk 62; and then the release key lever, encountering the universal bar 61, depresses the same, moving the indicating wheel 58 forward one tooth to the mark corresponding to the beginning of the line.

In case the keyboard of my transmitter is the key-board of a typewriter, the indicating mechanism above

described may be omitted, as the carriage of the typewriter, and the indicator customarily provided in connection therewith, serves the same purpose as the disk 62.

The operation of my improved transmitter is as follows: Normally, the transmitting contact mechanism is in the position shown, shaft 4 and drum 1 being in rotation, rocker 16 oscillating, and the pin 22 of the contact mechanism being stationary, being prevented from rising, when its rise would be permitted by the rocker 16, by the stops 2; while pin 23 is moving up and down with its corresponding end of the rocker 16, recesses 24 of all of the stops 2 being in line with pin 23 as they pass over said pin; but this vibration of pin 23 does not change the position of contact arm 7. Supposing now that one of the finger keys be depressed, the depression of such key causes the depression of the master-bail 79, and of an appropriate combination of selecting bails 34. By the depression of bail 79 motion is transmitted through spring 81 to the lever 45, which lever thereupon opens the clutch 5 and engages the lock wheel 49 and arrests the rotation of the drum 1; this occurs before the motion of the finger key downward is completed. Such motion continuing, the selecting bails actuated by the depression of this finger key, transmit motion through links 77 and bell-cranks 78 to the corresponding push-pins 30, and these push-pins in turn press in the stops 2 which are opposite the ends of the push-pins so actuated at the instant. As soon as the finger key is released, the push-pins are withdrawn out of engagement with the stops 2, being withdrawn so far as to clear the ends of such stops 2 as have not been pressed in, and then, through the rise of the master-bail 79, the tooth 50 of lever 45 releases stop wheel 49, and clutch 5 is permitted to close, and the shaft 4 and drum 1 begin to rotate. The first stop 2 will have been pressed in, and therefore pin 22 will be permitted to rise, and in so doing, will reverse the contact arm 7, causing the same to complete contact with stop 9, and so initiating a signal. Supposing the first current impulse of a signal to be transmitted to be a short impulse or dot, and further assuming (as will be supposed to be the case) that one stop when pressed in corresponds to a dot, and three stops when pressed in correspond to a dash, then when pin 22 is withdrawn, pin 23 enters the recess 24 of the next stop (said stop not having been pressed in) and contact arm 7 is moved back into contact with stop 10, terminating the signal. If, however, the first pulse of a signal is a dash, three stops having been pressed in, then at the first attempt of pin 23 to rise, such rise will be prevented, the recess 24 of the second stop 2 not being over the end of pin 23; but when the fourth stop (counting from the one first pressed in) is over pin 23, said pin will be permitted to rise, and in so doing, will reverse contact arm 7, terminating the signal.

It will be seen that by pressing in suitable combinations of the stops 2, any desired telegraphic signal may be transmitted. It will be obvious that instead of one stop corresponding to a dot and three stops to a dash, a plurality of stops may correspond to a dot and a greater number to a dash. As the drum continues to rotate, the stops 2 which have been pressed in encounter the resetting cam 27 and are pressed back, or reset, to their first position.

In another application for Letters Patent filed Feb. 27, 1905, Sr. No. 247,462, I have illustrated a similar mechanically operated transmitter, also another transmitter which is similar except that the pushpins 30 are actuated by electromagnets electrically controlled by the selecting mechanism, and except that the pins 22 and 23 of the transmitting contact mechanism engage the ends of the stops 2 instead of entering recesses in said stops. In said application I have claimed the invention broadly and also have claimed specifically the transmitter having the electrical connection between the devices for adjusting the stops and the keyboard. In this application therefore, I claim merely the transmitter having mechanical connections between the devices for adjusting the stops and the keyboard, and the construction involving the use of stops having recesses with which the controlling devices of the contact mechanism engage.

It is obvious that various forms of mechanism for adjusting the stops by the action of the finger keys may be employed; that the transmitter herein illustrated and described is susceptible of many other variations and modifications without departing from the spirit and scope of my invention, and further, that certain parts may be used in connection with other parts of different construction. I do not limit myself therefore to the particular details of construction, arrangement and operation herein illustrated and described.

What I claim is:—

1. In a telegraph transmitter, the combination with a movable carrier, adjustable circuit-controlling devices carried thereby, and mechanical adjusting means therefor, of a keyboard, selecting mechanism operated thereby mechanically connected with and adapted to operate said adjusting means, and contact mechanism comprising controlling members adapted to be vibrated but arranged to be controlled in such vibration by said circuit-controlling devices, driving means automatically operated adapted to vibrate said members, and contact means operated by the vibration of said members.

2. In a telegraph transmitter, the combination with a movable carrier, means for driving the same adjustable circuit-controlling devices carried thereby, and mechanical adjusting means therefor, of a keyboard, selecting mechanism operated thereby mechanically connected with and adapted to operate said adjusting means, means operated by said keyboard for arresting the motion of said carrier prior to and during the engagement of the circuit-controlling devices thereof by said adjusting means, and contact mechanism controlled by said circuit-controlling devices comprising controlling members, means other than said circuit-controlling devices for vibrating the same, and contact means operated by the vibration of said members.

3. In a telegraph transmitter, the combination with a movable carrier, means for driving the same, comprising a clutch, adjustable circuit-controlling devices carried by said carrier, and mechanical adjusting means therefor, of a keyboard, selecting mechanism operated thereby mechanically connected with and adapted to operate said adjusting means, means operated by said keyboard for opening and closing said clutch, and arranged to open the same prior to engagement of said circuit-controlling devices by said adjusting means, and to close said clutch subsequent to the disengagement of said circuit-controlling means by said adjusting means, and contact mechanism controlled by said circuit-controlling devices.

4. In a telegraph transmitter, the combination with a movable carrier, means for driving the same comprising a clutch, adjustable circuit-controlling devices carried thereby, and push-pins for adjusting said circuit-controlling devices, of a keyboard, selecting mechanism operated thereby mechanically connected with and adapted to oper-

ate said push-pins, means operated by said keyboard for opening said clutch prior to the engagement of said push-pins with said circuit-controlling devices and for closing said clutch after disengagement of said circuit-controlling devices by said push-pins, and contact mechanism controlled in its operation by said circuit-controlling devices.

5. In a telegraph transmitter, the combination with a movable carrier, means for driving the same comprising a clutch, adjustable circuit-controlling devices carried thereby, and push-pins for adjusting said circuit-controlling devices, of a keyboard, selecting mechanism operated thereby mechanically connected with and adapted to operate said push-pins, means operated by said keyboard for opening said clutch prior to the engagement of said push-pins with said circuit-controlling devices and for closing said clutch after disengagement of said circuit-controlling devices by said push-pins, and contact mechanism comprising controlling members, means for vibrating the same, and contact means operated by the vibration of said members.

6. In a telegraph transmitter, the combination with a movable carrier, means for driving the same, adjustable stops carried thereby, and mechanical adjusting means for setting said stops, of a keyboard, selecting mechanism operated thereby mechanically connected with and adapted to operate said adjusting means, and contact mechanism comprising controlling fingers, adapted to be vibrated but controlled in such vibration by said stops, means for vibrating said fingers, and contact means operated by the vibration of said fingers.

7. In a telegraph transmitter, the combination with a movable carrier, adjustable stops carried thereby, means for driving the carrier comprising a clutch, locking means for said carrier, and mechanical adjusting means for setting said stops, of a keyboard, selecting mechanism operated thereby mechanically connected with and adapted to operate said adjusting means, clutch-operating and lock-operating means operated by said keyboard in advance of the adjustment of said stops and subsequent to the disengagement of the stops by said adjusting means, and contact mechanism controlled by said stops.

8. In a telegraph transmitter, the combination with a movable carrier, adjustable stops carried thereby, means for driving the carrier comprising a clutch, locking means for said carrier, and mechanical adjusting means for setting said stops, of a keyboard, selecting mechanism operated thereby mechanically connected with and adapted to operate said adjusting means, means operated by said keyboard for opening said clutch and operating said locking means prior to the engagement of said stops by the adjusting means, comprising an elastic connection between the keyboard and locking means, and contact mechanism controlled by said clutch.

9. In a telegraph transmitter, the combination with a movable carrier, adjustable stops carried thereby, means for driving the carrier comprising a clutch, locking means for said carrier, means for opening said clutch and operating said locking means to lock the carrier, and for releasing said carrier and closing said clutch, and mechanical adjusting means for setting said stops, of a keyboard, means operated mechanically by said keyboard for adjusting said stops differently for each different key depressed, and means operated by the keys of said keyboard when depressed for operating said clutch and locking means.

10. In a telegraph transmitter, the combination with a movable carrier, adjustable stops carried thereby, means for driving the carrier comprising a clutch, locking means for said carrier, means for opening said clutch and operating said locking means to lock the carrier, and for releasing said carrier and closing the clutch, and mechanical adjusting means for setting said stops, of a keyboard, means mechanically operated by said keyboard for adjusting said stops differently for each different key depressed, and means operated by the keys of said keyboard when depressed and comprising an elastic connection for operating said clutch and locking means.

11. In a telegraph transmitter, the combination with a movable carrier, means for driving the same, and adjustable circuit-controlling devices carried thereby, of a key-

board, means operated mechanically by said keyboard for adjusting said circuit controlling devices differently for each different key operated, and contact mechanism comprising controlling members adapted to be vibrated but arranged to be controlled in such vibration by said circuit-controlling devices, means for vibrating said members, and contact means operated by the vibration of said members.

12. In a telegraph transmitter, the combination of a movable carrier, means for driving the same, and adjustable circuit-controlling devices carried thereby, of contact mechanism comprising controlling members adapted to be vibrated toward and from said circuit-controlling devices, said devices having recesses adapted to be entered by said controlling members, and means for adjusting said circuit-controlling devices differently for each different character to be transmitted.

13. In a telegraph transmitter, the combination of a movable carrier, means for driving the same, and a plurality of movable stops carried thereby, of contact mechanism comprising controlling members adapted to be vibrated toward and from said stops, said stops having recesses adapted to register with one or another of said controlling members according to the adjustment of the stops, and means for adjusting said stops differently for each different character to be transmitted.

14. In a telegraph transmitter, the combination with a movable carrier, circuit-controlling devices carried thereby, and means for driving said carrier intermittently comprising a clutch, of a plurality of finger keys, selecting mechanism operated thereby and means operated by said selecting mechanism for adjusting said circuit-controlling devices, and a master-bar operated by all of said keys, arranged to open said clutch prior to engagement of said circuit-controlling devices by the adjusting means therefor, and to close said clutch after disengagement of said circuit-controlling devices by said adjusting means.

15. In a telegraph transmitter, the combination with a movable carrier, circuit-controlling devices carried thereby, and means for driving said carrier comprising a clutch, of finger keys, selecting mechanism, means for adjusting said circuit-controlling devices, and a master-bar operated by said finger keys and controlling said clutch.

16. In a telegraph transmitter, the combination with a movable carrier, circuit-controlling devices carried thereby, and means for driving said carrier comprising a clutch and a lock, of finger keys, selecting mechanism, means for adjusting said circuit-controlling devices, and a master-bar operated by said finger keys and means operated thereby for operating said clutch and lock, comprising a yielding connection.

17. In a telegraph transmitter, the combination with a revoluble drum, adjustable sliding stops carried thereby, and means for driving said drum, of a keyboard, selecting means operated thereby, a plurality of levers arranged with their ends opposite stops of said drum and provided with means for adjusting said stops, and links connecting said levers with said selecting mechanism, whereby said levers are operated positively in both directions.

18. In a telegraph transmitter, the combination with a revoluble drum, adjustable sliding stops carried thereby, and means for driving said drum, of a keyboard, selecting means operated thereby, a plurality of levers having their portions adjacent to said drum bent to bring their ends opposite stops of said drum, said levers provided with means for adjusting said stops, and connected with and operated by said selecting mechanism.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN C. BARCLAY.

Witnesses:

FRANK KILTON,
C. A. VAN BRUNT.