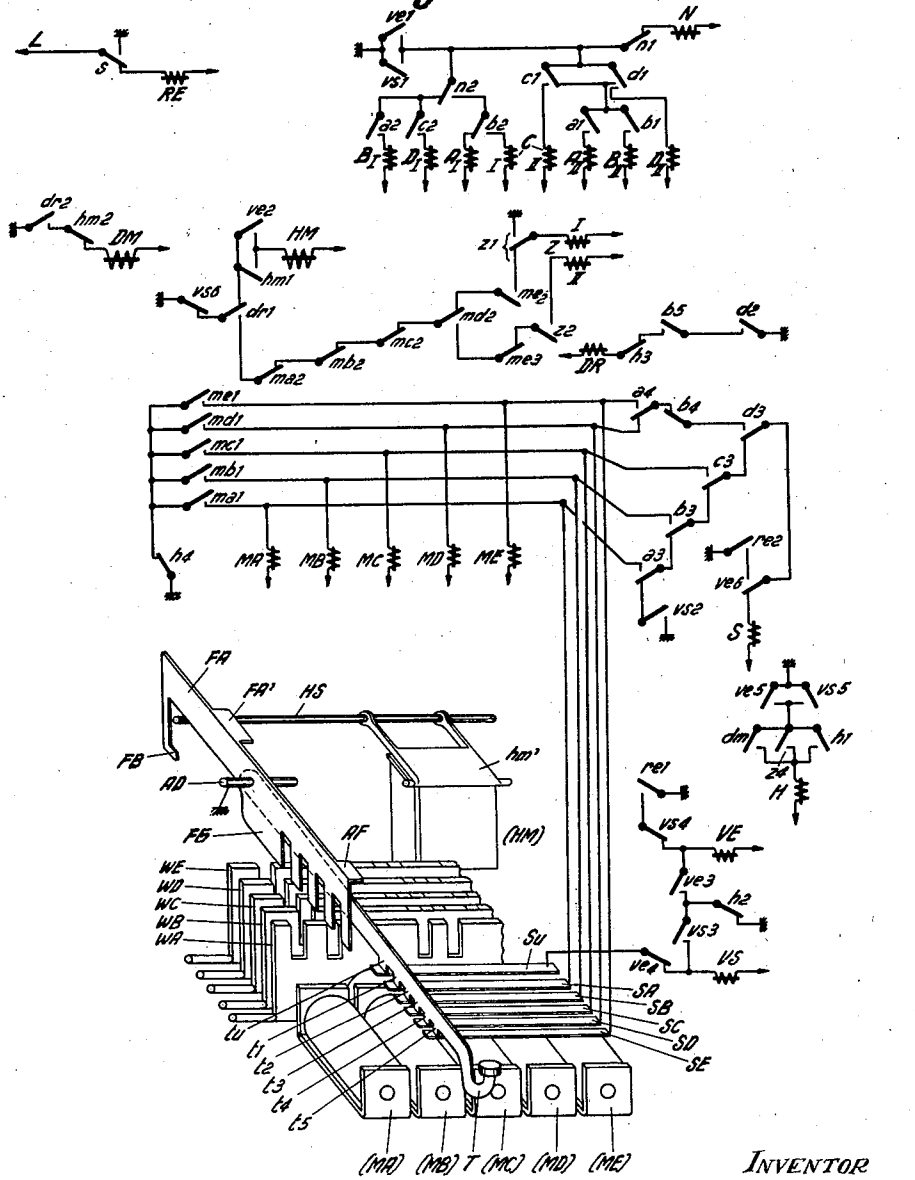
Aug. 24, 1937. M. HEBEL 2,090,944

TYPE PRINTING TELEGRAPH

Filed Nov. 29, 1935 2 Sheets-Sheet 1

Fig. 1



INVENTOR
MARTIN HEBEL
BY Gill & Jennings
ATTORNEYS.

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Filed Nov. 29, 1935 2 Sheets-Sheet 2

Fig. 3

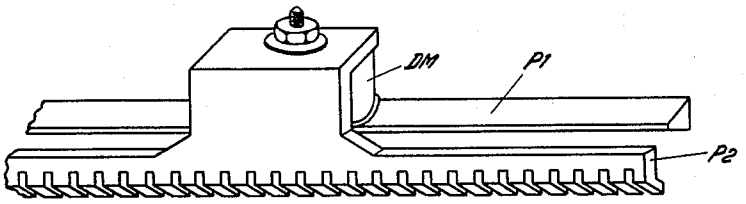


Fig. 4

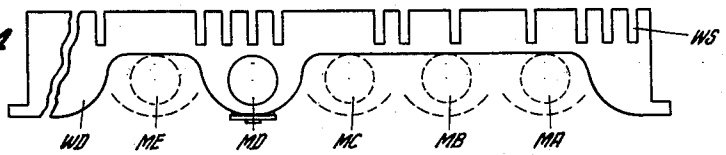


Fig. 5

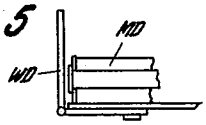
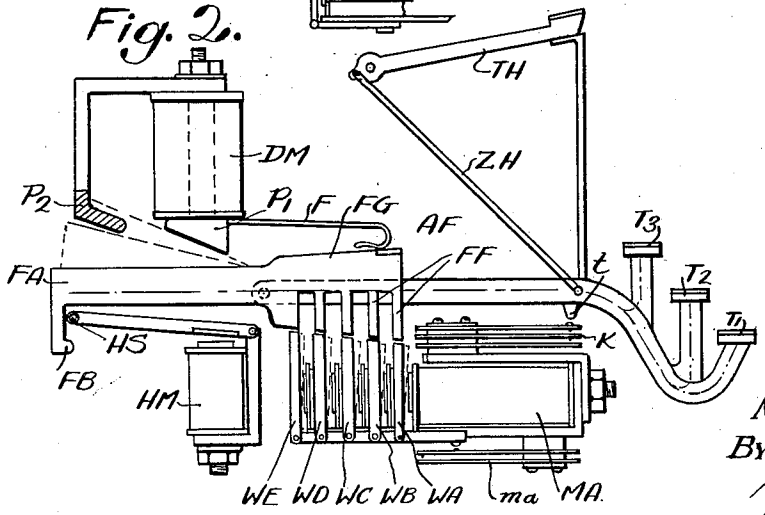


Fig. 2.



INVENTOR
MARTIN HEBEL
BY
Gill & Jennings
ATTORNEYS.

Patented Aug. 24, 1937

2,090,944

UNITED STATES PATENT OFFICE

2,090,944

TYPE PRINTING TELEGRAPH

Martin Hebel, Hechendorf a P., Germany, assignor to Autophon Aktiengesellschaft, Solothurn, Switzerland, a Swiss company

Application November 29, 1935, Serial No. 52,234
In Germany December 5, 1934

19 Claims. (Cl. 178—23)

The invention relates to a type printing telegraph in which the transmission of the signal elements is effected on the start-stop principle. For this purpose distributors are necessary both for the transmitter and for the receiver which determine the correct sequence of the elements.

In accordance with the invention, a chain of relays controlled by a cadence tapper is used as a distributor for the various elements. The provision of such a chain of relays simplifies the construction of the transmitting and receiving devices and enables all necessary control operations to be effected without the use of a special driving motor. The provision of a cadence tapper for controlling the relays allows the relays of the chain to be independent of each other so that small errors which may occur in the operation of the various relays are not additive, as would be the case if a number of relays or groups of relays were provided in which each relay or group of relays controlled the next. This is of considerable importance because only a very short time is available for the operation of the various relays. Thus, when operating on the start-stop system, it is usual for a signal to consist of five elements preceded by a start element and followed by a stop element and to transmit signals at the rate of 7 per second, so that only 1/49th part of a second is available for each signal element. It is, therefore, essential that the relays of the chain be controlled in such a way that errors or irregularities in the response of the various relays are not additive. This is achieved in accordance with the invention by providing a cadence tapper for controlling the relays.

In order that the invention may be properly understood and be more readily carried into effect, an example of construction and operation of an installation in accordance therewith will now be described with reference to the accompanying drawings, in which:—

Figure 1 shows the basic circuit arrangement of a type printing telegraph in accordance with the invention,

Figure 2 the basic construction of the type printing telegraph,

Figure 3 the construction of the printing magnet, and

Figures 4 and 5 a front and side elevation of a selecting member.

The keys T in Figure 1 or T1, T2, T3 in Figure 2 arranged as in the usual typewriter are pivotally mounted on a pin AD. Each key is connected to a type lever TH through a tie rod ZH, and, on depression of a key, the type lever TH associated with it is pivoted by the tie rod as in a normal typewriter so that the type is brought into the recording position. The paper and colour ribbon shift devices are not illustrated in the drawings. They can be the same as those which are used in typewriters.

A number of feeler members FG equal to the number of keys and, therefore, of type levers, is also pivotally arranged on the pin AD. Each of these members consists of a two-armed lever and is under the influence of a spring F. The front end of each feeler member FG is formed with teeth or fingers FF which rest on five selecting members WA—WE (Figure 2) formed as pivoted rods. 5 selecting magnets MA—ME are associated one with each selecting member. If the selecting magnet MD is energized, then the associated selecting member WD is swung about its pivot so that it no longer supports the corresponding finger FF of the feeler members. The selecting member WE is similarly displaced on energization of the magnet ME and so on. The selecting members WA—WE are provided with slots WS (Figure 4) which are so arranged that a different one of the feeler members FG but only one at any time can be turned about its pivot according to that one or that combination of the selecting members WA—WE which is displaced by the selecting magnets. With five selecting members WA—WE each having two different positions, there are 32 different selecting possibilities and, therefore, up to 32 feeler members can be provided, only one of which is at any time displaced out of its illustrated normal position.

The rear end FA of each feeler member FG is formed as the armature of a printing magnet DM (Figure 3). This magnet DM has two pole pieces P1 and P2 which run transversely above the feeler members FG. In the normal position of the feeler members, in which the fingers FF rest on the upper faces of the selecting members WA—WE, the ends FA are at such a distance from the pole pieces P1 and P2 that they are not attracted on energization of the printing magnet DM. When one or the other or a number of the selecting members WA—WE is actuated, one of the feeler members is released and its fingers FF engage, under the influence of its spring F, in the slots WS in a selecting member while its end FA approaches the poles P1 and P2 of the printing magnet DM and, indeed, comes into a position in which it can be attracted to these poles on energization of the magnet.

When fully attracted, the armatures FA come to bear against the pole piece P1, this being al-

lowed by slits in the pole piece P2 (Figure 3) provided for improvement of the magnetic path. To facilitate the attraction, each armature FA can be made wider beneath the pole piece P1, for example, by means of a lug FA' seen in Figure 1.

Each feeler member FG also has a lateral extension or lug AF at its front end which, on the preliminary displacement of the feeler member FG under the influence of its spring F when a selecting member is moved, comes to bear on the associated key lever T. When, therefore, the feeler member FG is displaced still further on energization of the printing magnet DM, then the key T associated with the feeler member will be depressed by the lug AF, and the type lever TH associated with it will be struck.

The rear arm FA of each feeler member FG is in the form of a hook FB, all of which can be acted upon by a rod HS controlled by the re-setting magnet HM. When this magnet HM is energized, the rod HS presses on all the hooks FB so that the feeler members FG are pivoted against the action of their springs F and the fingers FF are brought out of contact with the selector members WA—WE. The magnet HM is only energized when the selector members WA—WE are to be moved. In the normal position the fingers FF of the feeler members FG bear on the selecting members WA—WE and prevent any undesired movement of the latter under the influence of vibrations and the like. Consequently, the selector members WA—WE can be controlled directly by the associated selecting magnets MA—ME, no special controlling springs need be provided and the provision of devices for preventing undesired displacement of the selector members in the normal position is avoided. The armature FA of a feeler member attracted to the pole piece P1 can again be pulled away from the poles by means of the rod HS actuated on energization of the release magnet HM.

For sending a signal, up to five different circuits have to be actuated by each key T. There are five contact bars SA—SE, indicated diagrammatically in Figure 1, which lie under all the keys T. Each key has up to five projections *t1*—*t5* which come into contact with the bars SA—SE on depression of the key. A sixth bar SU is also shown in Figure 1. This bar can make contact with a projection *tu* with which each key is provided and through which the circuit for the initiation of the control steps is closed. In the arrangement illustrated in Figure 2, there is a set of contacts K associated with each key instead of the contact bars SA—SE. This set of contacts is actuated by a lug *t* on the key when the latter is depressed.

A chain of relays A—D is provided for ensuring the correct timing of the current impulses selected for transmission on depression of a key and for the distribution of the received current impulses to the various selecting magnets MA to ME. These relays A—D are actuated in succession by means of a cadence tapping relay N working as a self-interrupting relay. This cadence tapper works at a precisely predetermined cadence, that is to say, it always holds its armature attracted for particular, equal lengths of time and released for the same lengths of time. At the first energization of the relay N, owing to the closing of one of the contacts *ve1* and *vs1* and operation of the contact *n2*, the winding I of the relay A is energized and the relay A, by operation of its contact *a1*, closes a holding circuit for its winding II and, by operation of its contact *a2*, prepares the relay B for energization. At the first release of the cadence tapping relay, by operation of the contact *n2*, the winding I of the relay B is energized and the relay B, by operation of its contact *b1*, closes a holding circuit for its winding II and, by operation of its contact *b2*, prepares the relay C for energization. At the second attraction of the cadence tapping relay N by operation of the contact *n2*, the winding I of the relay C is energized; the relay C, by operation of its contact *c1*, closes a holding circuit for its winding II and thus, at the same time, interrupts the holding circuit for the relays A and B so that these relays release; and the relay C, by operation of its contact *c2*, prepares the relay D for energization. At the second release of the cadence tapping relay N, by operation of the contact *n1*, the winding I of the relay D is energized and the relay D, by operation of its contact *d1*, closes a holding circuit for its winding II. At the third attraction of the cadence relay N, by operation of the contact *n2*, the winding I of the relay A is again energized. The relay A, by operation of its contact *a1*, closes a holding circuit for its winding II and, by operation of its contact *a2*, prepares the relay B for energization. At the third release of the cadence tapping relay N, by operation of the contact *n2*, the winding I of the relay B is energized again and, by means of its contact *b1*, closes a holding circuit for its winding II. If now the contacts *v1* and *vs1* are opened again, then all relays A—D revert to the normal position. There are six different conditions of the relays A—D set up at successive beats of the cadence tapping relay N:—

1st beat—attraction relay A energized.
2nd beat—relays A and B energized.
3rd beat—relay C energized.
4th beat—relays C and D energized.
5th beat—relays A, C and D energized.
6th beat—relays A, B, C and D energized.

There are also a number of auxiliary relays in the circuit:—The relay VS is only actuated during the transmission of signals and puts the devices for the reception of signals out of action; the relay VE, on the other hand, is only actuated during the reception of signals and puts the transmitting devices out of action; the relay DR serves for controlling the printing magnet DM; the relay H serves for resetting the switch devices into the normal position at the end of the transmission of a signal; the current impulses arriving through the line L are received by a relay RE and are retransmitted to the switching devices. During transmission of a signal, the current impulses are transmitted to the line by a relay S.

The arrangement operates as follows:—

If a signal is to be sent, then the key T associated with it is depressed. This, first of all, causes a contact to be made by the contact bar SU and the relay VS to be energized in the following circuit: +, pin AD, key lever, projection *tu*, contact bar SU, contact *ve4*, relay VS, —.

Relay VS responds in this circuit, switches in the cadence tapping relay N by operation of its contact *vs1*, closes a circuit for the transmitting relay S by operation of its contact *vs2*, closes a holding circuit for itself by operation of its contact *vs3* and prevents the auxiliary receiving relay VE from being energized on opening of the contact *vs4* and actuation of the other receiving devices on opening of the contact *vs5*. The transmitting relay S is thus energized in the following circuit: +, contacts *vs2*, *a3*, *b3*, *c3*, *d3*, *ve6*, relay S, —. The contact *s* causes the line L to be connected to the positive side of the source of

current and thus the start impulse which prepares the receiver connected at the other end of the line is transmitted through the line. The circuit for the relay S is held closed until the first relay A of the chain of relays A—B is energized, that is to say, until the first attraction of the series of transmitting steps occurs.

By depression of the key T, other contacts are also made with the contact bars SA—SE and indeed, with all of them or with only some of them, according to the train of current impulses associated with the signal to be sent. If, for example, the train of current impulses to be sent consists of the current elements + − + − +, then the actuated key is one having only three projections *t1*, *t3* and *t5* and has no projections *t2* and *t4*. Consequently, on depression of the key, contact is made only with the contact bars SA, SC and SE and the contact bars SB, SD are not connected to earth.

If now, at the beginning of the first beat of the relay N, the relay A responds, the following circuit for the transmitting relay S will be closed: contact bar SA, contacts *a3*, *b3*, *c3*, *d3*, *ve6*, relay S, —. As in the example under consideration, the contact bar SA is to be earthed by the actuated key, the transmitting relay S is again energized in this circuit and the contact *s* causes the line L to be connected to the positive side of the source of current. When, at the beginning of the second beat of the relay N, the relay B responds, the following circuit is closed for the transmitting relay S: contact bar SB, contacts *b3*, *c3*, *d3*, *ve6*, relay S, —. As in the example under consideration, the contact bar SB is not to be earthed, the relay S releases and throws its contact *s*.

At the beginning of the third beat, the relay C responds and the following circuit is closed: contact bar SC, contacts *c3*, *d3*, *ve6*, relay S, —. As the contact bar SC is to be earthed, the relay S again responds and connects the line to the positive side of the source of current.

At the beginning of the fourth beat, the relay D is energized and the following circuit is closed for the relay S: contact bar SD, contacts *a4*, *b4*, *d3*, *ve6*, relay S, —. As in this particular example, the contact bar SD is not to be earthed, the relay S is devoid of current and returns its contact *s* into the normal position.

When the relay A responds at the beginning of the fifth beat, the following circuit is closed:— contact bar SE, contacts *a4*, *b4*, *d3*, *ve6*, relay S, —. As the contact bar SE is to be earthed, relay S again responds and connects the line to the positive side of the source of current.

When at the beginning of the sixth beat, the armature B responds, the circuit for the transmitting relay S is interrupted at the contact *b4*. The relay S releases and returns its contact *s* to the normal position so that the stop impulse is transmitted through the line. At the same time, by energization of the relay B, the following circuit is closed for the relay DR: +, contacts *d2*, *b5*, *h3*, relay DR, —. By operation of its contact *dr2*, the relay DR closes the following circuit for the printing magnet DM: +, contacts *dr2*, *hm2*, printing magnet DM, —. The printing magnet responds but none of the armatures FA are attracted because the feeler members FG are in the normal position. The magnet DM, however, actuates a contact *dm* through which the following circuit is closed for the relay H: +, contacts *vs5*, *dm*, relay H, —. On attraction, the relay H interrupts the holding circuit for the relay VS by operation of its contact *h2* so that this relay releases and, by operation of the contact *vs1*, switches out the cadence tapping relay N and the relays of the controlling chain A—D. Also, the contact *h5* interrupts the circuit of the relay DR so that this relay releases and interrupts the circuit for the printing magnet DM. All the switching devices are now again in the normal position and the transmission of the next signal can be begun.

When a signal is received and is to be printed, the received start impulse causes energization of the relay RE connected to the line L. This relay closes the circuit for the auxiliary receiving relay VE by operation of its contact *re1* and the relay VE switches in the cadence tapping relay N by operation of its contact *ve1*. The contact *ve2* closes a circuit for the release magnet HM: +, contacts *vs6*, *dr1*, *ve2*, magnet HM, —. The re-setting magnet HM responds and actuates the hooks FB of all the feeler members HB through the rods HS so that all the feeler members are brought out of contact with the selector members WA—WE. The relay VE also closes a holding circuit for itself through the contact *ve3* while by opening its contact *ve4*, it prevents energization of the transmitting auxiliary relay VS and by opening its contact *ve6*, prevents energization of the transmitting relay S. When, at the beginning of the first beat of the cadence tapper, the relay A responds, the following circuit is closed: +, contacts *re2*, *ve6*, *d3*, *c3*, *b3*, *a3*, selecting magnet MA, —. If, at this instant, the receiving relay RE is energized by the received current impulses, then the contact *re2* is closed and the selecting magnet MA responds so that the selecting member WA is pivoted. At the same time, the selecting magnet MA closes a holding circuit for itself by operation of its contact *ma1*.

At the beginning of the second beat, the following circuit for the selecting magnet MB is closed by the response of the relay B: +, contacts *re2*, *ve6*, *d3*, *c3*, *b3*, magnet MB, —. If the receiving relay is energized at this instant, then the contact *re2* is closed and the magnet MB is energized so that by operation of its contact *mb3*, it closes a holding circuit for itself and pivots the selecting member WB.

In the same way, at the beginning of the third beat, by response of the relay C the selecting magnet MC is brought under the control of the contact *re2* of the receiving relay; at the beginning of the fourth beat, the selecting magnet MD is brought under the control of the contact *re2* by the response of the relay D and at the beginning of the fifth beat, the selecting magnet ME is brought under the control of the contact *re2* by the further response of the relay A. Each of the selecting magnets MA to ME is thus brought under the influence of the transmission line only for the duration of one beat. If the signal formed by the elements + − + − + is received, then the selecting magnets MA, MC and ME are energized and their holding circuits are closed and the selecting members WA, WC and WE are displaced. The remaining selecting magnets MB and MD are not to be energized and the associated selecting members WB and WD remain in the normal position. It is now only that feeler member FG which is not supported by the selector members WA—WE which can drop, that is so say, the feeler member which lies above a slot WS (Figure 4) in the selector members WB and WD. However, this feeler member FG cannot yet drop because, due to the energization of the magnet HM, it is held by the rod HS acting on its hook FB. At the beginning of the sixth

beat, the relay B is energized and the following circuit is closed for the relay DR: +, contacts *d*2, *b*5, *h*3, relay Dr, —. The circuit for the resetting magnet HM is interrupted by the contact *dr*1 of the relay DR. The rod HS releases the feeler members and the selected feeler member engages in the selecting members WB and WD so that its armature FA is brought near the pole pieces P1 and P2. At the same time, the circuit of the printing magnet DM is prepared by operation of the contact *dr*2, and is closed on release of the magnet HM by operation of the contact *hm*2. The printing magnet DM is energized and attracts the armature extension FA of the feeler member engaging in the selecting members. In this way, the lug AF on this feeler member strikes the associated key T which actuates the associated type lever TH. By the response of the magnet DM, the contact *dm* is also actuated so that the following circuit is closed for the relay H: +, contacts *ve*5, *dm*, relay H, —. On its response, the relay H interrupts the holding circuit for the relay VE by operation of its contact *h*2 and the circuit for the relay DR by operation of its contact *h*3. The relay DR releases more quickly than the relay VE. Consequently, the following circuit is closed for a short time for the resetting magnet HM: +, contacts *vs*6, *dr*1, *ve*2, magnet HM, —. The magnet HM then causes the rod HS to draw the attracted armature FA of the actuated lever FG away from the pole pieces and then raises the front ends of all the feeler members FG. At the same time, the holding circuit of all actuated selecting magnets MA—ME is interrupted by operation of the contact *h*4 so that these magnets release their armatures and the selecting members WA—WE can return into the normal position uninfluenced by the feeler members FG. The magnet HM also interrupts the circuit of the printing magnet DM by operation of the contact *hm*2. When the receiving relay VE has allowed its armature to release, the cadence tapping relay N and the relays A—D of the controlling chain are cut out. The circuit for the relay H is thus likewise interrupted.

As only 32 different signals can be transmitted by means of signals formed of five current impulses, it is usual for a train of current impulses to correspond to a number of signals and to select a particular signal for printing by means of a shift step. The type levers can therefore have two different types on them, say a letter of the alphabet and a numeral or a sign, and by means of the shift, the one or the other of the types is printed when the type lever is struck. In the usual typewriters, this shift is effected by lifting the carriage.

A magnet Z is provided for effecting the shift. This magnet Z is energized on reception of the signal consisting of the current elements — — — — +. If this sequence of current impulses is received, then it is only the selecting magnet ME which is energized and when, at the beginning of the sixth beat, the relay DR responds, the following circuit is closed: +, contacts *vs*6, *dr*1, *ma*2, *mb*2, *mc*2, *md*2, *me*2, *z*1, winding I of magnet Z, —. On response, the magnet Z, by operation of its contact *z*1, closes a holding circuit through its winding I and displaces the paper strip in such a way that signals belonging to the second group, for example, numerals, are printed as happens when the shift key of the usual typewriter is depressed. For switching back to the first group, a signal formed of the current elements — — — + — is sent. In this way, only the magnet MD is energized so that on response of the relay DR, the following circuit is closed: +, contacts *vs*6, *dr*1, *ma*2, *mb*2, *mc*2, *md*2, *me*3, *z*2, winding II of magnet Z, —.

The winding II on energization produces a magnetic flux in the opposite direction to that produced by the winding I so that the magnet Z causes its armature to release and again stops the displacement of the paper strip. The magnet Z can, of course, be actuated on reception of signals formed from other combinations of current elements by suitable alteration of the switching devices. It is also possible to effect the shift not by means of a special magnet Z but mechanically under the influence of the printing magnet DM. In this case, on reception of the shift signal, a feeler member has to be selected just as on receipt of other signals. This feeler member then carries out the shift when attracted by the printing magnet.

The described telegraph printer operates as a strip printer in which the paper feed is effected by the movement of the keys as in the normal typewriter. If the arrangement is to be made as a page printer, then special magnets are required for the feed, the return movement of the carriage and the line shift which operate a sort of stepping switch movement. In this way, the magnets can be switched in and out by contacts controlled by the carriage.

I claim:

1. Type printing telegraph having devices working on the start-stop system for the emission of signals in the form of trains of current impulses, comprising a plurality of keys, a plurality of devices controlled by said keys for selecting a train of current impulses, and a distributor for emission of the selected train of current impulses comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper.

2. Type printing telegraph having devices working on the start-stop system for the reception of signals in the form of trains of current impulses, comprising a number of type selecting magnets corresponding to the number of current impulses in a train and a distributor for distributing the received current impulses to said type selecting magnets, comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper.

3. A type printing telegraph having devices working on the start-stop system for emitting and receiving signals in the form of trains of current impulses, comprising a plurality of keys, a plurality of devices controlled by said keys for the selection of a train of current impulses, a number of type selecting magnets corresponding to the number of current impulses in a train and a distributor for emitting the selected train of current impulses and for distribution of the received current impulses to said selecting magnets comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper.

4. A type printing telegraph having devices working on the start-stop system for emitting

and receiving signals in the form of trains of current impulses, comprising a plurality of keys, a plurality of devices controlled by said keys for the selection of a train of current impulses, a number of type selecting magnets corresponding to the number of current impulses in a train, a distributor for emitting the selected train of current impulses and for distribution of the received current impulses to said selecting magnets comprising a series of relays, an electromagnetic cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper and a source of current for controlling said cadence tapper.

5. A type printing telegraph having devices working on the start-stop system for emitting and receiving signals in the form of trains of current impulses, comprising a plurality of keys, a plurality of devices controlled by said keys for the selection of a train of current impulses, a number of type selecting magnets corresponding to the number of current impulses in a train and a distributor for emitting the selected train of current impulses and for distribution of the received current impulses to said selecting magnets comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper.

6. A type printing telegraph having devices working on the start-stop system for the reception of signals in the form of trains of current impulses, comprising a number of type selecting magnets corresponding to the number of current impulses in a train, a distributor for distributing the received current impulses to said type selecting magnets, comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper and switch means controlled by said selecting magnets for closing holding circuits for said selecting magnets after they have been influenced by said distributor.

7. A type printing telegraph having devices working on the start-stop system for the reception of signals in the form of trains of current impulses, comprising a number of type selecting magnets corresponding to the number of current impulses, a plurality of pivotable permutation members controlled by said type selecting magnets, a plurality of contacts controlled by said type selecting magnets and adapted to close holding circuits for said magnets and a distributor for distributing the received current impulses to said selecting magnets comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper.

8. Type printing telegraph having devices working on the start-stop system for the reception of signals in the form of trains of current impulses, comprising a number of type selecting magnets corresponding to the number of current impulses in a train, a plurality of permutation members controlled by said selecting magnets and associated each with one of said selecting magnets, a plurality of feeler members controlled by said permutation members, an electromagnet, means controlled by said electromagnet for setting said permutation members out of a normal position and adapted to hold said feeler members out of contact with said permutation members during movement of the latter and a distributor for distributing the received current impulses to said electromagnets comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper.

9. A type printing telegraph having devices working on the start-stop system for the reception of signals in the form of trains of current impulses, comprising a number of type selecting magnets corresponding to the number of current impulses in a train, a pivotable armature associated with each of said selecting magnets, a plurality of permutation members formed as pivotable flaps and coupled to said armatures, a plurality of two-armed pivoted feeler members, a plurality of fingers on said feeler members adapted to be supported by said permutation members, a hook on each of said feeler members, a rod adapted to act on said hooks and remove said fingers out of contact with said permutation members, an electromagnet for actuating said rod and a distributor for distributing the received current impulses to said selecting magnets comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper.

10. A type printing telegraph having devices working on the start-stop system for the reception of signals in the form of trains of current impulses, comprising a number of type selecting magnets corresponding to the number of current impulses in a train, an armature formed as a pivotable flap for each of said selecting magnets and serving as a permutation member, a plurality of feeler members, a plurality of fingers on each of said feeler members adapted to be supported by said permutation members, a hook on each of said feeler members, a rod adapted to act on said hooks and remove said fingers out of contact with said permutation members, an electromagnet for actuating said rod, switch means for energizing said electromagnet during the movement of said permutation members, and a distributor for distributing the received current impulses to said selecting magnets comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper.

11. Type printing telegraph having devices working on the start-stop system for the reception of signals in the form of trains of current impulses, comprising a number of type selecting magnets corresponding to the number of current impulses in a train, a plurality of permutation members controlled by said selecting magnets and associated each with one of said selecting magnets, a plurality of types, magnetic actuating means for said types, a printing magnet common to all said magnetic actuating members, a plurality of feeler members controlled by said permutation members and associated each with one type and a magnetic actuating member for said types and adapted to bring the mag-

netic actuating member associated with it near a pole of said printing magnet whereby to permit said printing magnet to attract to the said pole the actuating member thus brought near it and a distributor for distributing the received current impulses to said selecting magnets.

12. A type printing telegraph having devices working on the start-stop system for the reception of signals in the form of trains of current impulses, comprising a number of type selecting magnets corresponding to the number of current impulses in a train, a plurality of permutation members controlled by said selecting magnets, a plurality of type carriers, a plurality of magnetic actuating members for said type carriers, a printing magnet common to all said magnetic actuating members, a plurality of feeler members controlled by said permutation members and associated each with a type carrier and a magnetic actuating member for said type carriers and each adapted to bring the magnetic actuating member associated with it near a pole of said printing magnet, means for energizing said printing magnet whereby to permit it to draw to the said pole only that actuating member which has been drawn near it by a feeler member, electromagnetic means common to all said actuating members for displacing the attracted actuating member away from the pole of said printing magnet and a distributor for distributing the received current impulses to said selecting magnets comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper.

13. A type printing telegraph having devices working on the start-stop system for the reception of signals in the form of trains of current impulses, comprising a number of type selecting magnets corresponding to the number of current impulses in a train, a plurality of permutation members controlled by said selecting magnets, a plurality of type carriers, a plurality of magnetic actuating members for said type carriers, a printing magnet common to all said magnetic actuating members, a plurality of feeler members controlled by said permutation members and associated each with a type carrier and a magnetic actuating member for said type carriers and each adapted to bring the magnetic actuating member associated with it near a pole of said printing magnet, means for energizing said printing magnet whereby to permit it to draw to the said pole only that actuating member which has been drawn near it by a feeler member, electromagnetic means common to all said actuating members and to all said feeler members for displacing the attracted actuating member away from the pole of said printing magnet and for removing said feeler members out of contact with said permutation members during the movement of said permutation members and a distributor for distributing the received current impulses to said selecting magnets comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper.

14. Type printing telegraph having devices working on the start-stop system for the reception of signals in the form of trains of current impulses, comprising a plurality of type carriers, a number of selecting magnets of one of said type carriers corresponding to the number of current impulses in a train, a plurality of permutation members controlled by said selecting magnets, a plurality of feeler members controlled by said permutation members and formed as two-armed levers, fingers on one of said arms of each of said feeler members adapted to abut against said permutation members, a printing magnet common to all feeler members, a magnetic armature formed by the other arm of each of said feeler members for said printing magnet and adapted to be brought near the poles of said printing magnet as a result of a displacement of said permutation members, said printing magnet being adapted on being energized to attract to its poles only that one of its said armatures which has been thus brought near it, means associated with each of said feeler members for actuating one of said type carriers on being attracted to a pole of said printing magnet, and a distributor for distributing the received current impulses to said selecting magnets comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper.

15. A type printing telegraph having devices working on the start-stop system for emitting and receiving signals in the form of trains of current impulses, comprising a plurality of keys, means for selecting a train of current impulses controlled by said keys, a plurality of type carriers controlled by said keys, a number of selecting magnets for the selection of a type carrier corresponding to the number of current impulses in the selected train, a plurality of permutation members controlled by said selecting magnets, a number of feeler members corresponding to the number of type carriers and controlled by said selecting members, means for actuating a feeler member for its selection by a permutation member, said feeler member being adapted, on its actuation, to control a type carrier, and a distributor for emitting the selected train of current impulses and for distributing the received current impulses to said selecting magnets comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper.

16. A type printing telegraph having devices working on the start-stop system for emitting and receiving signals in the form of trains of current impulses, comprising a plurality of keys, means for selecting a train of current impulses controlled by said keys, a plurality of type carriers controlled by said keys, a number of feeler members constructed as two-armed levers corresponding to the number of type carriers, a number of selecting magnets for the selection of a type carrier corresponding to the number of current impulses in the selected train, a plurality of permutation members controlled by said selecting magnets and adapted to select one of said feeler members, a plurality of fingers on one of said arms of each of said feeler members adapted to abut on said permutation members, means for causing said arm to actuate a type carrier, a printing magnet common to all said feeler members, a plurality of magnetic armatures for said printing magnet formed by the other of the two arms of each of said feeler members, each of said armatures being adapted to be

independently drawn near the poles of said printing magnet by the feeler member on which it is formed on displacement of said permutation members whereby to permit said printing magnet to attract to its poles only that feeler member which has been thus brought near it and to cause said feeler member to strike the type carrier associated with it, a magnet common to all said feeler members adapted to remove an attracted feeler member away from the poles of said printing magnet and to displace all said feeler members out of contact with said permutation members during the movement of said permutation members and a distributor for distributing the received current impulses to said selecting magnets comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper.

17. Type printing telegraph having devices working on the start-stop system for the reception of signals in the form of trains of current impulses, comprising a number of type selecting magnets corresponding to the number of current impulses in a train, a plurality of permutation members controlled by said selecting magnets, a plurality of type carriers, a plurality of magnetizable feeler members controlled by said permutation members and adapted to actuate said type carriers, a printing magnet common to all said feeler members and having two elongated pole pieces, one of which is formed like a comb with slits for the reception of said feeler members, a spring acting on each of said feeler members and adapted to urge a feeler member into a position near said poles from which said printing magnet is adapted to attract such a feeler member, and a distributor for distributing the received current impulses to said selecting magnets comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper.

18. A type printing telegraph having devices working on the start-stop system for the reception of signals in the form of trains of current impulses, comprising a number of selecting magnets corresponding to the number of current impulses in a train, a plurality of permutation members controlled by said selecting magnets, a plurality of type carriers, a number of feeler members corresponding to the number of type carriers and controlled by said permutation members, a printing magnet common to all said feeler members and adapted to attract the feeler member selected by said permutation members, an auxiliary magnet common to all said feeler members and adapted to remove said attracted feeler member away from the vicinity of the poles of said printing magnet as well as to bring all said feeler members out of contact with said permutation members, switch means for controlling the energization of said printing magnet and the energization of said auxiliary magnet and adapted, on energization of said printing magnet, to prepare the energization of said auxiliary magnet and, after response of said printing magnet, to cause said auxiliary magnet to be energized, and a distributor for distributing the received current impulses to said selecting magnets comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper.

19. Type printing telegraph having devices working on the start-stop system for emitting and receiving signals in the form of trains of current impulses, comprising a plurality of keys, a plurality of devices for the selection of a train of current impulses controlled by said keys, a number of selecting magnets corresponding to the number of current impulses in a train, a plurality of permutation members controlled by said selecting magnets, a plurality of type carriers controlled by said keys, a number of feeler members corresponding to the number of type carriers adapted to actuate a type carrier and each controlled by said selecting members, a printing magnet common to all said feeler members, an auxiliary magnet common to all said feeler members adapted to bring said feeler members out of contact with said permutation members, switch means for controlling the energization of said printing magnet and of said auxiliary magnet, a distributor for emitting the selected sequence of current impulses and for distribution of the received current impulses to said selecting magnets, said switch means being controlled by said distributor and said distributor comprising a series of relays, a cadence tapper and switch means controlled by said cadence tapper and adapted to close an energizing circuit for said relays one at a time and in succession at each actuation of said cadence tapper.

MARTIN HEBEL.