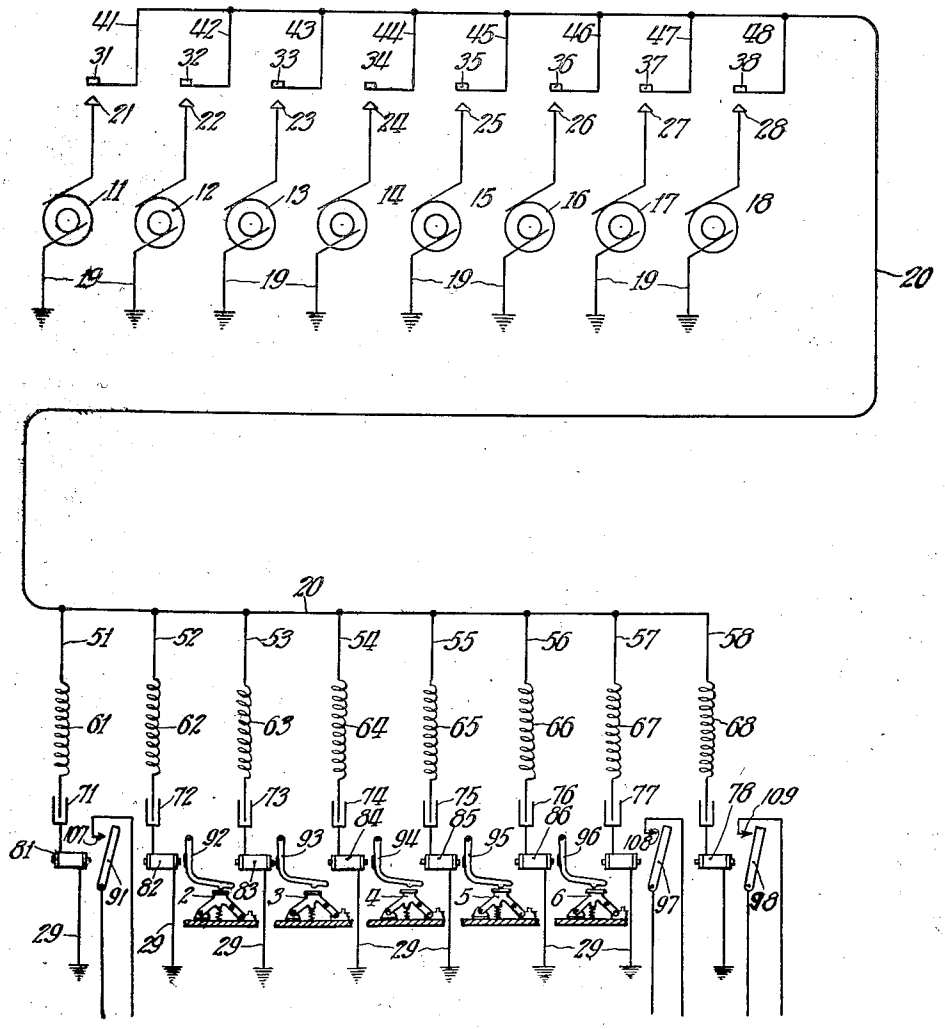
April 30, 1929. W. C. BRUMDER 1,711,137

TYPEWRITER OPERATING MEANS

Filed Jan. 20, 1927 2 Sheets-Sheet 1

Fig. 1.



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TYPEWRITER OPERATING MEANS

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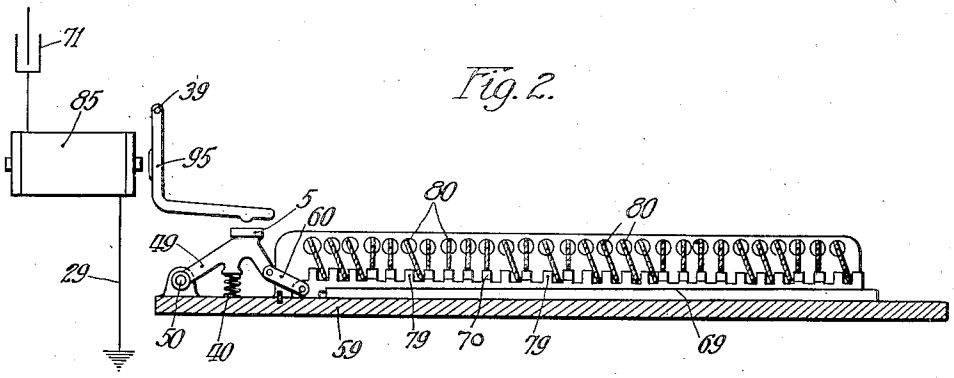


Fig. 2.

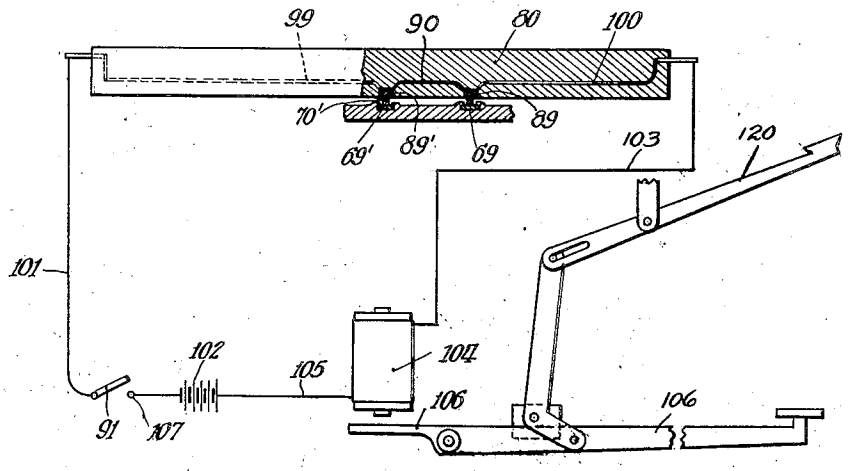
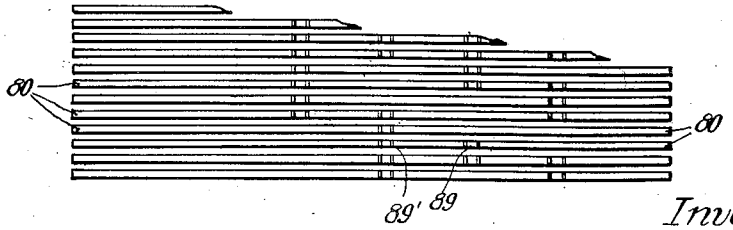


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM C. BRUMDER, OF MILWAUKEE, WISCONSIN.

TYPEWRITER-OPERATING MEANS.

Application filed January 20, 1927. Serial No. 162,397.

My invention relates to typewriter operating means, and more particularly to means for operating a typewriter from a remote point. This application is filed in place of my abandoned application Serial No. 578,662, filed July 31, 1922.

It is a purpose of the invention to provide means for operating a typewriter, which is preferably of the type disclosed in my Patent 1,198,322, patented Sept. 12, 1916. In the typewriter disclosed in said patent the letters or characters are written by means of type-bars, or other similar members, the operation of which is controlled by the selective operation of a very small number of controlling elements or keys compared with what is used in the ordinary typewriter, which means is operated from a point remote from the typewriter.

In the device shown in said patent a plurality of mechanically operated members or keys are provided which actuate certain switching members which are adapted to cooperate with certain contacts, whereby certain combinations of said switching members will close such contacts as to complete a circuit from a source of power through an electromagnet which is adapted to operate the selected type-bar. Each combination of switching elements will only operate its particular type-bar in the manner outlined above. The actuating members or keys are mechanically connected with the switching members, which makes it necessary that the switching members be in close proximity to the keys. It will, of course, be possible to place the keyboard at a certain place and the typewriter and electromagnets at a different location and run the conductors corresponding to each of the type-bars from the operating means to the typewriter, but this would require a large network of wires. It is a purpose of the invention to provide means for operating a typewriter of the character described above from a remote point whereby a similar small number of keys or operating members can be used for manually selecting the letters or characters that are to be imprinted on the paper, and which may operate said typewriter without the use of a large number of conductors, the currents necessary for operating the device being preferably sent over a single conductor which forms part of a grounded circuit.

It is well known that by proper tuning relays can be provided which will be operated by a given frequency and which will not be affected by a current of a different frequency. It is moreover well known that if certain of said frequencies are used which are above the audible frequencies and below those used in wireless telegraphy and telephony, especially frequencies below 100,000 per second and above 20,000 per second, the energy is largely carried by the ether, but is still sufficiently linked to the conductor, that the same acts as an efficient guide for the high frequency electromagnetic waves. A single conductor forming part of a grounded circuit can be very effectively used for conducting waves between the frequencies mentioned. It is moreover well known that a plurality of such high frequency waves of different frequencies may be impressed on the same line simultaneously, and by properly tuning certain relays in circuits tapped off said line, these frequencies may be so separated that each set of waves will only affect the relay tuned to its frequency.

It is a further purpose of the invention to employ frequencies of the character set forth above which are impressed on the line by suitable key operated, or other means, for operating the mechanism described in the before mentioned patent from a remote point.

It is still a further purpose of the invention to provide means whereby the operating devices of the typewriter will not function until one certain circuit is closed by means of its relay, which circuit is to be closed subsequent to the closing of the other circuits necessary to select a certain type-bar, whereby the selection of the wrong type-bar by the failure to press the selector keys simultaneously, is avoided. It will be seen that if one of the keys selects a certain type-bar and if said key taken with another key selects a different type-bar, it would be possible by failure to strike both keys simultaneously to operate the first type-bar, when it is desired to operate the second type-bar. By providing a circuit closing key independent of these keys, which must be operated in combination with all the combinations of the other keys to operate any one of the type-bars, this can be avoided.

Other objects and advantages of the invention will appear as the description of the accompanying drawings proceeds. However, I desire to have it distinctly understood that I do not intend to limit myself to the exact details shown or described, but that I intend to include as part of my invention all such obvious changes and modifications of parts as would occur to a person skilled in this art,

and as would fall within the scope of the claims.

In the drawings:

Fig. 1 is a diagram of the circuit connections used for transmitting the selections made at a remote point to the selective switching devices used for operating the type-bar;

Fig. 2 is a view partly diagrammatic and partly in side elevation of one of the switching devices showing the contact carrying members cooperating therewith in section;

Fig. 3 is a view partly in elevation and partly in longitudinal section of one of the contact carrying members, the circuit connections being shown diagrammatically; and

Fig. 4 is a fragmentary bottom plan view of a plurality of the contact carrying members showing the relative positions of the contacts thereon.

Referring in detail to the drawings, in Fig. 1 is shown a plurality of generating devices 11, 12, 13, 14, 15, 16, 17, and 18, each of which is provided with a ground connection 19, said generating devices being each adapted to generate a current of a high frequency, the frequencies of the current of each of said generating devices differing from those of the others. The frequencies used are preferably between 20,000 and 100,000 per second, for example, the generating device 11 may generate a current having a frequency of 50,000 per second, the generating device 12 a current having a frequency of 55,000 per second, the generating device 13 a current having a frequency of 60,000 per second, the generating device 14 a current having a frequency of 65,000 per second, the generating device 15 a current having a frequency of 70,000 per second, the generating device 16 a current having a frequency of 75,000 per second, the generating device 17 a current having a frequency of 80,000 per second and the generating device 18 a current having a frequency of 85,000 per second. It is, of course, to be understood that the frequencies need not be exactly those mentioned or that the intervals between the frequencies need be of the amounts given above. All that is necessary is that there be enough difference that all other frequencies can be tuned out when any one frequency is to operate certain devices.

The generating devices 11, 12, 13, 14, 15, 16, 17 and 18 each have connected therewith the terminals 21, 22, 23 24, 25, 26, 27 and 28 respectively with which the keys 31, 32, 33, 34, 35, 36, 37 and 38, cooperate respectively. The conductors 41, 42, 43, 44 45, 46, 47 and 48 respectively extend to the line wire 20. The wire 20 extends from any suitable location at which the above mentioned keys are located to the location of the typewriting machine or other device controlled thereby. A number of taps on the line 20 at the receiving end is provided, corresponding to the number of generating devices at the sending end of the line, said taps being designated by the numerals 51, 52, 53, 54, 55, 56, 57 and 58. Each of said taps is provided with a ground connection 29 and with a relay, a condenser and an inductance in series between said line and said ground connection. The tap 51 is provided with an inductance 61, and a condenser 71, which are so proportioned as to tune the relay 81 so that the current of the frequency generated by the generating device 11 only will pass through the same. In a similar manner the condenser 72 and inductance 62 are used to tune the relay 82 to the frequency of the generating device 12, and the inductance 63, 64, 65, 66, 67 and 68 respectively with the condensers 73, 74, 75, 76, 77 and 78 tune the relays 83, 84, 85, 86, 87 and 88 so that they will be affected respectively only by the frequencies generated by the generating devices 13, 14, 15, 16, 17 and 18. Thus it will be seen that the key 31 will control the relay 81, the key 32 the relay 82 and the keys 33, 34, 35, 36, 37 and 38 the relays 83, 84, 85, 86, 87 and 88 respectively.

The relays 82, 83, 84, 85 and 86 are provided with armatures 92, 93, 94, 95, and 96, which are adapted to engage with the keys 2, 3, 4, 5 and 6 shown in my Patent No. 1,198,322, and it will be seen that any one of the keys can be depressed as desired by operating the corresponding key at the sending station, that is, the key 32 controls the key 2, the key 33 the key 3, etc. In Fig. 2 the key 5 is shown, the armature 95 pivoted at 39 and attracted by the solenoid or relay 85 depressing the key 5, the key 5 being returned by means of a spring and being provided with an arm 49 pivoted at 50 to a support 59 and having a link 60 connecting the same with the slidable bar 69, the details of operation of which are described in the above patent. The bar 69 operates to complete certain operating circuits either in conjunction with bars associated with certain of the other keys or alone as the case may be. Said bars are provided with a plurality of projections, certain of which, such as the projections 70 are of conducting material and others of which, such as the projections 79, are of insulating material. Said projections are so arranged that they will enter recesses in conductor elements or circuit closers 80, the conductor elements 80 shown in Fig. 3, being provided with contacts at 89 and 89′, which are adapted to close the gaps between the conductor sections 90, 99 and 100 when the conducting projections 70 and 70′ on the bars 69 and 69′ enter the recesses in which same are located. The details of the operation of these devices whereby the selected type-bar, or other printing devices, are operated by pressing certain combinations of said keys 2, 3, 4, 5 and 6 respectively, are explained in the above mentioned patent. For the purpose of this in-

vention, it suffices to say that the bars constitute simultaneously movable members co-operating with the circuit closers 80 to complete a selected circuit.

From. Fig. 4 it will be seen that the members 80 extend at right angles to the direction of movement of the members 69 and 69′ and that the recesses therein are arranged in rows in alignment with the slidable bars 69, 69′, etc. It will also be seen that certain of the contact carrying elements are not provided with contacts located in recesses in said elements in alignment with said slidable bars, consequently when one of the members is actuated it will throw all of the elements that have no openings for receiving the projections on the bars into the inclined position shown in Fig. 2, thus making it impossible to complete a circuit through the same by any other slidable bar, because the same will be out of alignment with the conducting projections thereon. The various projections on the bars 69 and the contacts in the recesses on the elements are so arranged that for any combination of said keys only one character can be printed, this being explained more in detail in said Patent No. 1,198,322. From each of the bars 80 a conductor 101 extends to one terminal of a battery 102 and a conductor 103 extends to a solenoid 104, which is connected by means of a conductor 105 with the other terminal of the battery 102. When said solenoid 104 is energized, the lever 106 operating the type-bar is attracted by the solenoid 104 so as to operate the said type-bar, the number of conductors 101 and 105 returning to the battery 102 corresponds to the number of conductor elements 80 provided, which in turn corresponds to the number of type-bars or other devices to be actuated by said solenoid, each solenoid operating its individual type-bar. The relay 81 is provided with an armature 91 which acts as one element of a switch member comprising the contact 107, see Fig. 1. The switch comprising the members 91 and 107 is interpositioned between the battery 102 and all of the leads 101. Thus it will be seen that no actuating current will pass through the solenoid 104, even though the contacts at 89 and 89′ are closed, unless the key 31 is actuated to operate the relay 81 to close said switch. A similar switch comprising an armature 97 co-operating with the contact 108 may be provided for modifying the operation of the character impressing device, such as the type-bars, the modifying means being preferably a shift key. A switch 98 co-operating with contact 109 may be provided for operating a spacing device. The relay 81 operated by the key 31 is provided primarily to prevent the operation of the selective controlled device comprising the bars 69 and the elements 80, so as to actuate the wrong solenoid 104 in case all of the keys necessary to operate the desired solenoid are not actuated simultaneously.

In operation the key 31 is to be actuated after the other keys controlling the selective control device have been depressed. In operation, if the type-bar carrying the letter obtainable by depressing the keys 4 and 5, for example, is desired, the keys 35 and 34 are actuated which will simultaneously send over the line 20 current impulses having frequencies generated by the generating devices 14 and 15 which will affect the relays 84 and 85 to attract the armatures 94 and 95, thus depressing the keys 4 and 5 to operate the slidable bars associated therewith to complete the circuit in which the solenoid 104 is located that actuates the type-bar carrying said letter, except for the fact that a gap exists in the circuits comprising the members 91 and 107. Immediately subsequent to the depression of the keys 34 and 35 the key 31 is actuated sending current impulses from the generating device 11 over the line 20 which will affect the relay 81 so as to close the switch comprising the members 91 and 107, thus causing the actuation of the type-bar, or character impressing element 120. It is, of course, understood that the keys 34 and 35 must remain depressed while the key 31 is depressed, to complete the circuit. It will also be seen that none of the remote controlling devices will in any way affect the other controlling devices due to the fact that the said frequencies can be sent over the line simultaneously, and can be tuned out by means of the inductance coils and condensers so that only the frequency corresponding to any one relay will pass through the same to energize the same.

Having thus described my invention, what I desire to claim and secure by U. S. Letters Patent is:

1. In a character impressing device of the character described, the combination with a plurality of movable circuit closers, there being one of said circuit closers corresponding to each character, of means for selectively moving said circuit closers into circuit closing position, said means comprising a plurality of simultaneously movable members engaging said circuit closers and means for selectively operating said members from a remote point comprising a plurality of receiving devices tuned to different frequencies and a corresponding number of sending devices for impressing corresponding frequencies on said receiving devices, each of said receiving devices corresponding to one of said movable members, and each of said sending devices corresponding to one of said receiving devices, said receiving devices each comprising a single armature for operating one of said movable members.

2. In a character impressing device of the

character described, the combination with a plurality of movable circuit closers, there being one of said circuit closers corresponding to each character, of means for selectively moving said circuit closers into circuit closing position, said means comprising a plurality of simultaneously movable members, means for selectively controlling said members from a remote point comprising a plurality of receiving devices tuned to different frequencies and a plurality of sending devices for impressing corresponding frequencies on said receiving devices, each of said receiving devices corresponding to one of said movable members, and separate means comprising a receiving and corresponding sending device for completing each of said circuits.

3. In a device of the character described, a plurality of character impressing elements, a plurality of movable circuit closers each corresponding to one of said elements, means for selectively moving said circuit closers into circuit closing position, said means comprising a plurality of simultaneously movable members, means for selectively controlling said members from a remote point comprising a plurality of receiving devices tuned to different frequencies and a plurality of sending devices for impressing corresponding frequencies on said receiving devices, each of said receiving devices corresponding to one of said movable members, means for changing the characters impressed by said elements, means for operating said last mentioned means from a remote point comprising a receiving device tuned to a different frequency than said other receiving devices and a sending device impressing a corresponding frequency on said receiving devices, and means independent of said operating means and said receiving devices for completing said circuits subsequent to the operation of said circuit closers.

4. In a device of the character described, a plurality of character impressing elements, a plurality of movable circuit closers each corresponding to one of said elements, means for selectively moving said circuit closers into circuit closing position, said means comprising a plurality of simultaneously movable members, means for selectively controlling said members from a remote point comprising a plurality of receiving devices tuned to different frequencies and a plurality of sending devices for impressing corresponding frequencies on said receiving devices, each of said receiving devices corresponding to one of said movable members, means for modifying the printing characteristics of said elements relative to the material upon which the characters are impressed, means for operating said modifying means from a remote point comprising a receiving device tuned to a different frequency than said other receiving devices and a sending device impressing a corresponding frequency on said receiving devices, and means independent of said modifying means and said receiving devices for completing said circuits subsequent to the operation of said circuit closers comprising a distinctively tuned receiving device and a corresponding frequency impressing sending device.

In witness whereof, I hereunto subscribe my name this 14th day of January, A. D., 1927.

WILLIAM C. BRUMDER.