

Sept. 29, 1959

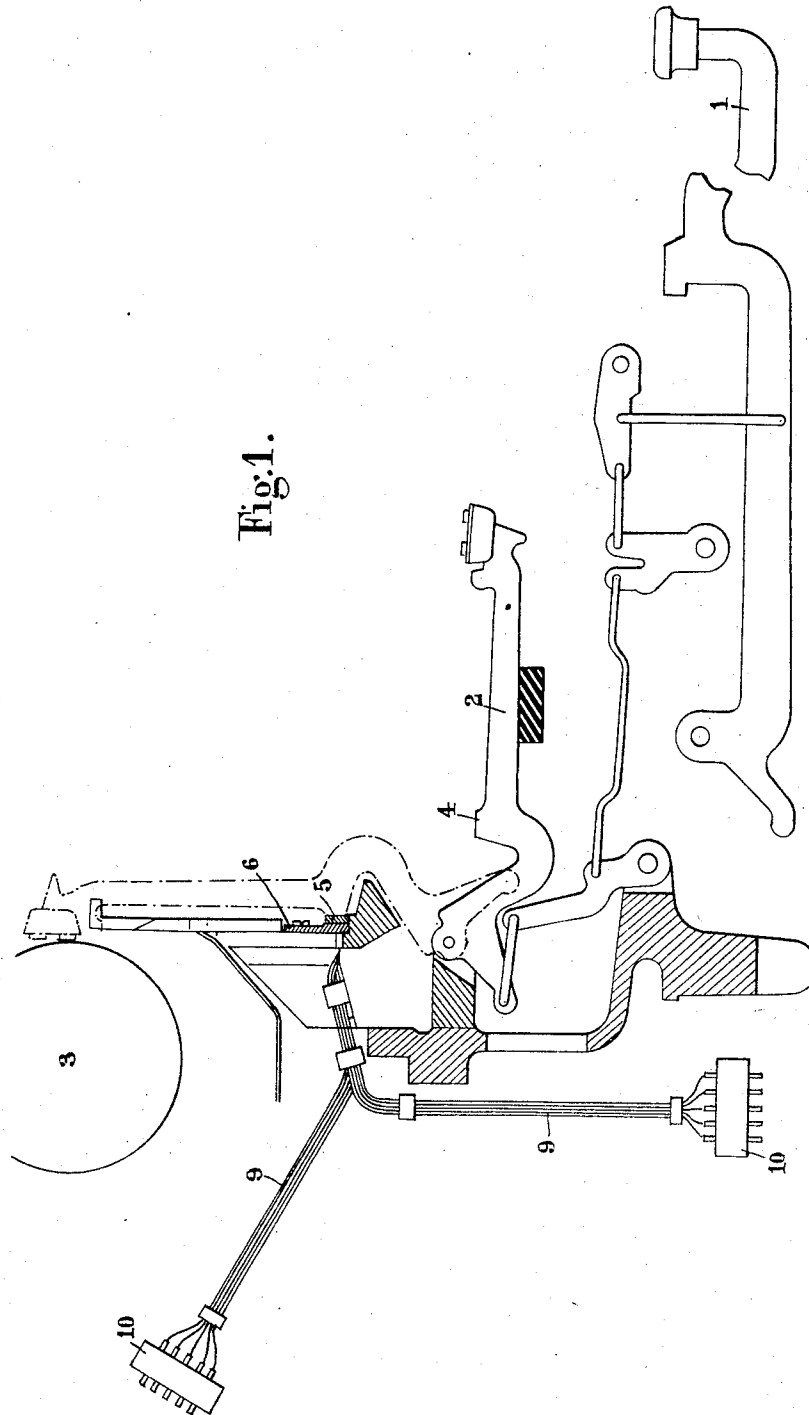
P. BECKER

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DEVICE FOR ELECTRICALLY INTERCONNECTING BUSINESS MACHINES

Filed Dec. 17, 1957

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 2.

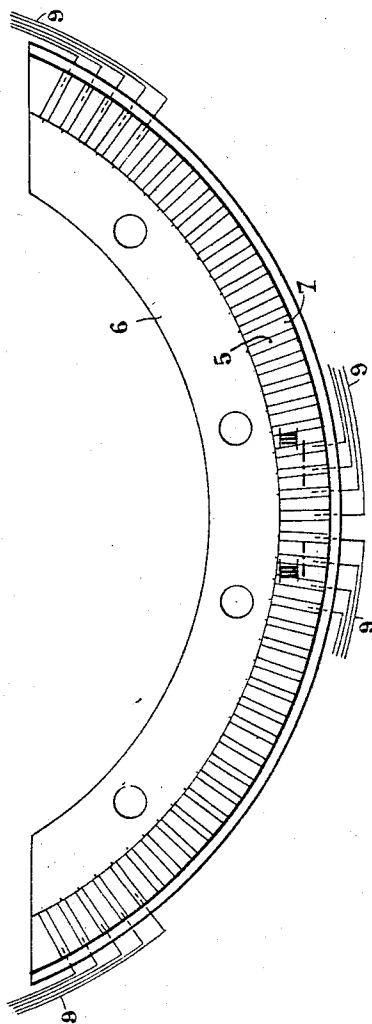


Fig. 3.

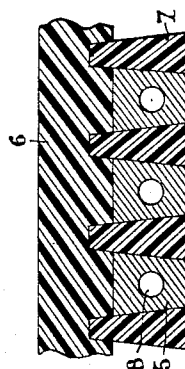
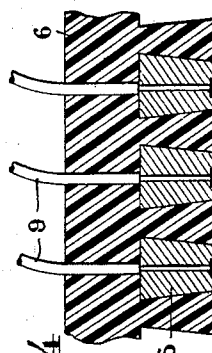


Fig. 4



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DEVICE FOR ELECTRICALLY INTERCONNECTING BUSINESS MACHINES

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3 Claims. (Cl. 197—5)

This invention relates to improvements in business and like machines adapted to be electrically interconnected, for example a primary machine provided with keys and printing members (commonly called "type-bars") co-acting with a paper-carrying impression roller to cause, when the operator depresses the keys, not only the printing of an original document on the sheet of paper, but also through electric pulses the operation of at least one secondary machine in which said pulses are utilized.

The primary machine may be for example a typewriter and the secondary machine an accounting machine or a coding machine adapted to translate the text written by the typewriter into perforations formed in cards or tapes, or a combination of these two machines.

The known devices of this type for transmitting electric pulses from a typewriter comprise essentially a number of contacts each associated with a key controlling a type-bar, the depression of one key causing the relevant contact to be closed. One drawback characterizing devices of this type is that one is never sure that a depression actually produces a pulse and vice-versa, for if a type-bar is thrown towards the impression roller by the depression of the corresponding key before the preceding type-bar has resumed its inoperative position two contacts are closed simultaneously, and as a result this device will obviously slow down considerably the velocity of operation of the machine equipped therewith.

In view of the foregoing, it is the essential object of this invention to avoid this double inconvenience by providing a device for controlling the transmission of electric pulses at the very moment the type-bars print the corresponding letter, digit or sign, without altering whatsoever or interfering with the normal operation of the machine.

According to this invention, at least one type-bar of the machine comprises a heel portion co-acting with an electric contact each time said type bar strikes or engages the impression roller and prints a character on the paper carried by this roller.

Thus, simultaneously with the printing of a character by the type-bar actuated by the key depressed by the operator, this type-bar closes during a very short fraction of a second an electric circuit passing through this contact.

In order to perform with certainty the simultaneous striking of a character and closing of the electric contact, during the relative displacement of the type-bar towards the impression roller, in spite of possible misadjustments and variations in the diameter of the impression roller which may be due to the differences in the thickness of the paper carried thereby, at least one of the members co-acting to form the electric contact must have a certain resiliency.

This resiliency, for example in the case of typewriters and more particularly in the case of machines of the "thrown" striking action type, may be the inherent resiliency of the type-bar proper.

Each type-bar may be equipped with a single contact.

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The electric contacts may be arranged to open or close an electric circuit comprising two conductors leading thereto; however and preferably these contacts are bare studs and the type-bar itself closes the conducting circuit leading to each of these studs; to this end, the complete machine may be brought to a potential differing from that of said studs.

This invention is particularly simple and advantageous to carry out when, as in the case of typewriters, the machine is already provided with a set of stops limiting the stroke of the type-bars towards the impression roller.

In a typewriter, for example, each type-bar, upon completion of its stroke subsequent to the depression of a key, is disposed in front of a substantially semi-circular member called segment, and in addition it is usually provided with a heel adapted, when the relevant key is depressed, to strike a ring concentric with this segment.

In this case, it is not necessary to provide another heel on the type-bar, and the conventional ring is replaced by a series of electric contacts insulated from one another and each co-acting with one type-bar heel.

With the device of this invention it is evident that the striking of the type-bar, and the transmission of a corresponding electric pulse cannot take place separately. Moreover, the striking action is exactly the same as in any conventional typewriter or like business machine.

Thus, it is not possible to close two contacts simultaneously, as only one type-bar is allowed to strike the roller-carried sheet of paper, and when the type-bar corresponding to the depressed key engages the impression roller it positively prevents any other type-bar from engaging the roller.

In order to afford a clearer understanding of the present invention and of the manner in which the same may be carried out in the practice, reference will now be made to the accompanying drawings forming part of this specification and illustrating diagrammatically by way of example a typical embodiment of the invention. In the drawings:

Figure 1 is a diagrammatic section across a type-bar device of a known or conventional typewriter equipped with the contact arrangement according to this invention;

Figure 2 is a front view showing the segment of a typewriter modified in accordance with the teachings of this invention;

Figures 3 and 4 illustrate two alternate embodiments of the device of this invention, which are shown in section taken along the line III—III of Fig. 2.

In Fig. 1 illustrating the actuating mechanism of a type-bar of a conventional-type typewriter, the depression of the key 1 causes through a known link and rod mechanism the rotation of the type-bar 2 and the type carried thereby to strike the impression roller 3. The type-bar 2 carries the conventional heel portion 4 providing the necessary ring bearing; according to this invention, this heel portion 4 is also adapted to engage a conducting stud 5 carried by the segment 6 of the typewriter.

In the case illustrated the segment of the typewriter is made of a suitable insulating material (see Fig. 2) and carries as many conducting studs 5 as there are type-bars in the machine. These studs 5 are separated from one another by insulating blocks 7. If the segment 6 is fabricated by molding, the blocks 7 are formed integrally therewith (see Fig. 4). A cavity 8 is formed in each stud 5 to permit the fixation of conducting wires 9 thereon, for example by tin soldering. These conducting wires are assembled in the form of one or more bundles connected to terminal strips 10 (see Fig. 1). These terminal strips are connected in turn to a signal amplifying and coding device according to the specific application contemplated for these signals.

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The device according to this invention operates as follows:

The conducting wires 9 are normally brought through known means (not shown) to a polarization potential other than that of the typewriter.

When the type-bar 2 prints a letter, digit or other sign, the heel 4 engages the stud 5 and consequently the corresponding conducting wire 9 is brought to the potential of the typewriter.

As a result, a short change in the potential of conductor 9 takes place, and the corresponding pulse is transmitted through the terminal strip 10 to the amplifying and coding device (not shown). In this device the duration of the pulse thus produced may be extended, if desired, through any known and adequate means, for example a capacitor mounted in a suitable manner, or through any other convenient means, so as to produce a pulse of sufficient duration and proper direction to cause for example the energization of a relay. The pulse thus amplified at the output of the device may be used to perform any desired and suitable control action, for example the punching of a card or tape, the transmission of coded signals, etc. The device according to this invention gives the certainty that the type impression and the transmission of the corresponding electric pulse take place simultaneously. Of course, the number of studs may be altered without departing from the purpose of this invention.

More particularly, if it is desired to interconnect a primary typewriter with a secondary adding machine, only the type-bars corresponding to digits may be associated with electric contacts.

What I claim is:

1. A business machine, for example a typewriter, comprising an impression roller, type bars adapted to print on said roller and a type-bar check and guide segment, said business machine being adapted to be coupled with another receiving machine provided with a number of controls of the electric-pulse type, the type-bar check and guide-segment of said business machine comprising a same number of contacts insulated from one another, each of said contacts being engaged by a type bar when the latter strikes the roller, said business machine com-

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prising in addition a same number of conductors maintained at a voltage differing from that of the business machine and adapted to connect the contacts of said business machine to the pulse-type controls of said receiving machine respectively.

2. A business machine, for example a typewriter, comprising an impression roller, type bars adapted to print on said roller and a type-bar check and guide segment, said business machine being adapted to be coupled with another receiving machine provided with a number of controls of the electric-pulse type, the type-bar check and guide segment of said business machine comprising an element of insulating and resilient material and a same number of contact studs embedded in said element, each contact stud being engaged by a corresponding type bar when said type bar strikes said roller, said business machine comprising in addition a same number of conductors maintained at a voltage differing from that of the business machine and adapted to connect the contact studs of said business machine with the pulse-type controls of said receiving machine respectively.

3. A business machine, for example a typewriter, comprising an impression roller, type bars adapted to print on said roller and a type-bar check and guide segment, said business machine being adapted to be coupled with a receiving machine provided with a number of controls of the electric-pulse type, the type-bar check and guide segment of said business machine comprising a same number of contact studs insulated from one another, each of said contact studs having a hole formed therethrough and being engageable by a corresponding type bar when the latter strikes said roller, said business machine comprising in addition a same number of conductors maintained at a voltage differing from that of said business machine, each of said conductors being fitted through the hole of one of said contact studs and connecting said contact stud to one of said electric-pulse controls of said receiving machine respectively.

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