

July 27, 1926.

1,594,214

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MOTOR CONTROL FOR SELECTIVE SYSTEMS

Filed March 24, 1924

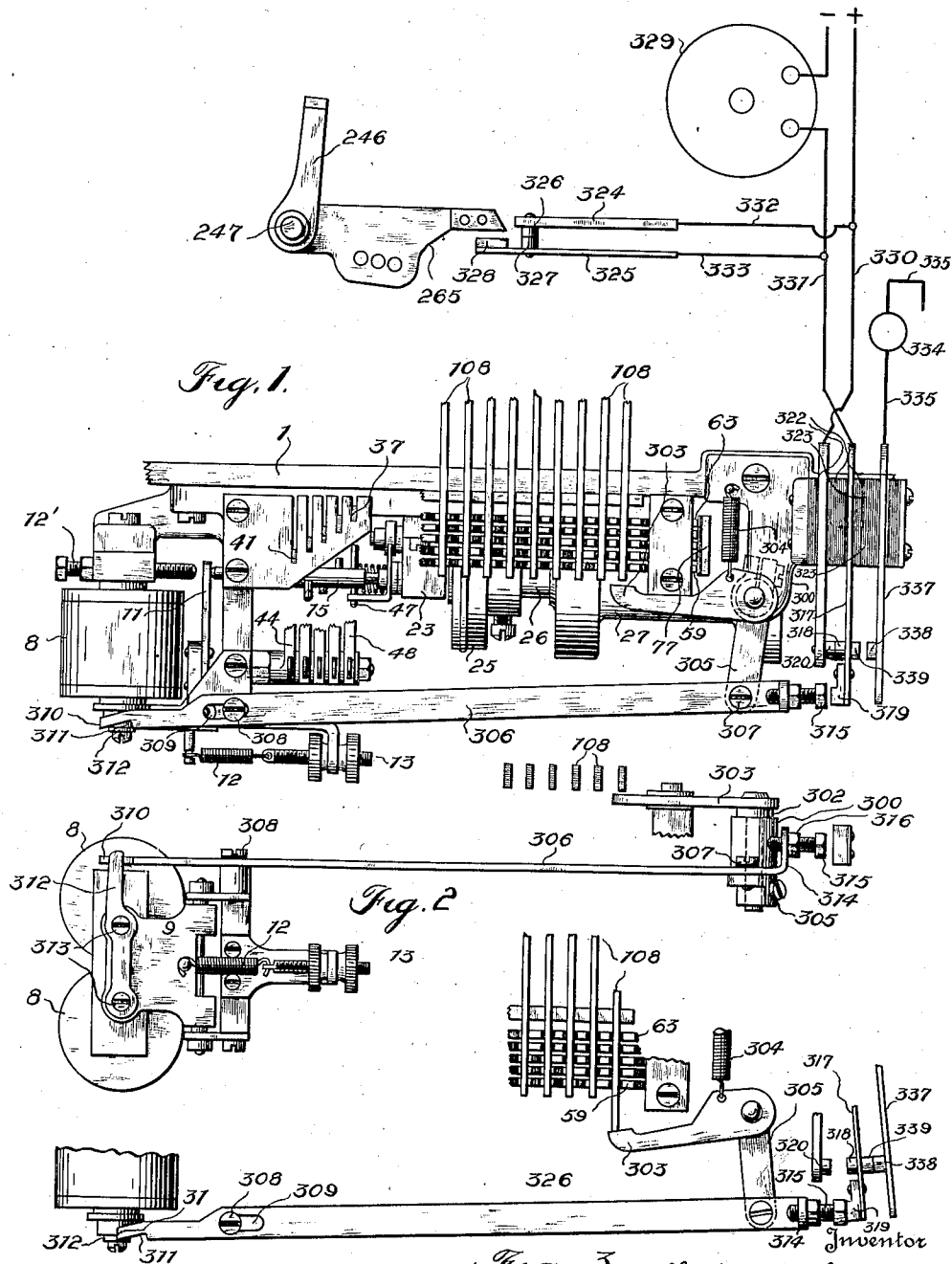


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## UNITED STATES PATENT OFFICE.

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## MOTOR CONTROL FOR SELECTIVE SYSTEMS.

Application filed March 24, 1924. Serial No. 701,522.

This invention relates to methods and apparatus for controlling motors and signalling in printing telegraph and like selective systems.

5 More particularly the invention relates to a system for starting and stopping motors and signalling operators at distant stations, in a manner particularly adapted for light traffic single magnet printers, although it  
10 will be understood that the various novel principles hereinafter set forth are applicable to printers of multiple magnet type controlled by rotary distributor switches and other types of telegraph and selective  
15 mechanisms.

In systems where a number of printer circuits in communication with outlying stations terminate in a room, if bell signals for attention at a printer are received, it is difficult for the operator to pick out the circuit  
20 which requires attention. Frequently the bell signals are sent to attract attention to matters that may be attended to at the convenience of the operator while other matters  
25 require immediate attention. A system of signalling auxiliary to the usual bells to indicate the circuits which are signalling, and to differentiate between more important and less important calls is highly desirable and  
30 adds to the efficiency of operation of the system.

The objects of the invention are to provide novel methods of starting and stopping motors by means controlled through the receiving  
35 selectors at each station; to provide a motor control operable under the control of the selector mechanism, or under the combined control of the printer shift mechanism and the selector mechanism; to provide a  
40 control operable to stop the motors at each station in response, to selective combinations sent out from any station and to start the same in response to the commencement of transmission or in response to the transmission  
45 of a special signal; to provide a main and an auxiliary call system, and such other objects as will appear hereinafter in the detailed description of preferred embodiments of the invention, of which—

50 Figure 1 is a fragmental plan view par-

tially in diagram of the mechanism applied to a single magnet selector.

Figure 2 is a fragmental front view of the mechanism shown in Figure 1.

Figure 3 is a fragmental plan view showing the mechanism in actuated condition.

The mechanism in the form disclosed is in the nature of an attachment to be operated by the single magnet selector disclosed in  
60 co-pending application, Serial Number 649,562, filed July 5, 1923. So much of this selector only and the printer parts are here shown and described in general, as will enable an understanding of the present invention to be had.

The parts of the selector and printer with which the parts of the present invention co-act have been given the same reference characters as in the copending case. The selector magnet 8 is preferably normally energized when no selections are being made.  
70 Each signal combination comprises a selector start condition, a code combination of selecting conditions and a selector stop condition. Magnet 8 is deenergized in response  
75 to a start condition and this permits endwise movement of cam shaft 15. Due to this endwise movement, shaft 15 starts into rotation and thereafter the code combinations are received and energize 8 in accordance with the  
80 received combinations to selectively position fingers 37 to 41. The cam shaft then trips a mechanism to permit notched selector bars 59 to 63 to assume positions in accordance with the selectively positioned  
85 fingers 37 to 41, and at the same time to set into operation the printing bail which will cause movement of the selected actuating bar 108 into the aligned selector bar slots, to cause an operating movement of the selected  
90 bar. While the selection set up on bars 59 to 63 is being carried out, restoration of fingers 37 to 41 and the resetting thereof in accordance with a succeeding selective combination may proceed. Carriage shift mechanism, including arms 246, shaft 247 and  
95 shaft arm 265 are arranged to be operated and locked in shifted condition, by an actuating bar 108 in response to a special shift signal, and to be released by an unshift bar 100

108 by a special unshift signal, all as described in the copending case.

To distinguish the parts of the invention that are new, reference characters commencing at three hundred will be used. Secured to base plate 1 is a support 300 in which a spindle 301 is rotatably supported. Spindle 301 has formed integrally therewith a bearing collar 302 and rigidly secured thereto is an actuating arm 303. A spring 304 secured to arm 303 and to support 300 normally forces the arm 303 against the selector support as shown in Fig. 1, with the end thereof directly in the path of actuating movement of one of the bars 108. Rigidly secured to the lower end of spindle 301 is an arm 305 to the outer end of which a member 306 is pivotally secured at 307, in a manner to be supported thereby. Member 306 extends across the front of the selector and is guided for movement by a pin or screw 308 which extends through a slot 309. A latch extension 310 is formed on the end of member 306, and a notch 311 is cut therein to permit the free movement of resilient latch member 312 rigidly secured to armature 9 by means of screws 313 so as not to interfere with the operation of the armature. At the other end 306 is bent at right angles and an adjustable contact operating screw 314 is screwed therein and secured by means of a lock nut 316. A spring contact member 317 is provided carrying contact 318 and an operating block 319 arranged in the path of movement of 315. Contact 318 is arranged to normally engage a contact 320 secured on a member 321. Members 317 and 321 are insulated from each other and from the mechanism by means of insulating members 322, and are secured to support 300 by screws 323. Suitably secured to the printer and properly insulated from each other are contact members 324 and 325, carrying contacts 326 and 327. A block 328 is secured to 327 and arranged in the path of arm 265 so that when the printer mechanism is locked in shifted position contacts 326 and 327 will be opened by member 265.

In practice, the printer motor 329 has the supply circuit connected in series by means of conductors 330, and 331 through contacts 318 and 320, and contacts 326 and 327 are connected by means of conductors 332 and 333 in shunt with respect to the circuit through contacts 320 and 318. When either set of contacts is closed the motor will run, and both sets must be opened to stop the motor. If desired the shift controlled circuit through contacts 326 may be eliminated in which event the motor will be stopped with the printer in the lower case.

An auxiliary signal lamp 334 is connected by conductor 335 to the negative pole of the electrical supply and to contact spring

337 upon which contact 338 is carried. Contact 338 is positioned to be engaged by a contact 339 carried by spring 317 when the bell actuating bar 109 is actuated. When contacts 338 and 339 and contacts 326 and 327 are closed a circuit for lamp 334 is completed. When either set of contacts is open the circuit through 334 is interrupted and the lamp will not light.

#### Operation.

When the contacts 326 and 327 are eliminated, and with the printer arranged to have the magnet energized in rest position as in closed circuit operation, the end of arm 303 is disposed in front of an actuating bar 108 which may be the blank signal bell operating bar or a special motor stop bar. Assuming the contacts 318 and 320 to be closed and the motor running, a signal is sent to actuate the special bar 108. The combination is received on the selector mechanism and bars 59 to 63 are set in accordance therewith. The printing mechanism then operates to permit the special bar 108 to drop into the aligned slots and when in the slots the end of this bar will be lowered and as the bail moves forward, the bar 108 will engage arm 303 and shift it together with spindle 301, arm 305 and bar 326 against the tension of spring 304 as shown in Fig. 3. This moves end 310 to the right in Fig. 3. As the motor stop signal will be sent only when the transmission is completed, after the signal is set up on the selector fingers and the printing mechanism is tripped by the cam shaft, magnet 8 will be energized. The movement of member 310 in response to the actuation of arm 303 will accordingly force member 312 outward and member 312 will then move into the position shown in Fig. 3 and will lock member 326 to the right in which position contacts 318 and 320 will be held open and the source of power supply to the motor will be cut off. In this manner the motor will come to rest. When the line is momentarily opened or a start condition of any signal is sent, magnet 8 will be de-energized and spring 12 will throw armature 9, with latch member 312 outward, releasing member 310 and permitting the parts to assume the position shown in Fig. 1 with contacts 318 and 320. Owing to the extreme lightness of rotating selector parts, the relatively large size and the starting characteristics of the motor the parts will come up to speed with sufficient rapidity to receive the selective impulses of the first transmitted signal properly on the selector. As there are no shift controlled contacts in this form, transmission of any signal will start operation. If the blank signal bell operating bar is utilized to operate member 303 the bell will ring and the contacts will open each time a

bell signal is sent. To ring the bell a number of times the bell signal may be sent successively from a keyboard or the line may be conditioned to de-energize 8 for automatic transmission in which case magnet 8 will not be actuated to latch the contacts 318 and 320 open. The inertia of the motor armature and moving parts will be sufficient to restore bar 108 and permit closing of contacts 318 and 320 in this case and ringing of the bell will continue. For closed circuit working using current and no current intervals a line interruption will ring the bell continuously and the motor will not stop.

If it is desired to utilize any other actuating bar 108 rather than the bell bar to stop the motor, or if it is desired to ring the bell successively by holding the line open without opening the motor supply circuit and still use the bell bar to control the motor stop, the shift controlled contacts 326 and 327 may be added in shunt to the contacts 318 and 320 in such position that they are held open by the printer mechanism in the upper case or figures position and are closed when the printer mechanism is in the lower or letters case. If the bar 108 which actuates arm 303 is selected with the printer in lower case position, the contacts 318 and 320 will be opened, but the motor supply circuit will be closed through contacts 326 and 327, and the usual function only will be performed by the bar 108. When however, the shift combination precedes this signal, both sets of contacts will be open and the motor will stop. After the motor is stopped in this manner, a momentary interruption of the line will de-energize 8 and start the motor, and the bell will continue to ring while the line is interrupted as above set forth. If the bell signal is sent from a keyboard member 306 will be latched to the right, as shown in Fig. 2 until it is released by the de-energization of magnet 8. An unshift or letters case signal must be sent after the motor is stopped to restore the printer to the letters case, in which position contacts 326 and 327 will again be closed. If desired the motor may be started by the transmission of the letters signal, in which event this will also serve to restore the printer to the letters case.

The operation of the auxiliary signalling system is as follows: If an operator wishes to ring the bell of his receiver at a remote station, to indicate that matter is to be transmitted which does not require immediate attention, he depresses his bell key the required number of times to indicate a message and follows the bell signal by depressing his "letters" key immediately. The result is that the bell rings at the receiver and at the same time contacts 338 and 339 are closed and flash the lamp 334 for each sig-

nal. The letters signal following the bell signals releases member 306, permits contacts 338 and 339 to open and extinguishes the lamp. The flash of the lamp and ringing of the bell indicate the circuit and the nature of the message being received. If immediate attention is desired the bell signals are not followed by another signal and accordingly the contacts 338 and 339 will be locked in closed position and lamp 334 will remain lighted at the end of the signal and until the required attention is given. The flashing of the lamp followed by a prolonged lighting thereof indicates the circuit and matters requiring immediate attention, while the flashing of the lamp only, indicates the circuit, and that immediate attention is not required.

The stop mechanisms may obviously be applied for open circuit working with magnet 8 normally de-energized by reversing the position of member 310 so that contacts 318 and 320 will be locked open with the magnet 8 de-energized and so that these contacts will be released and permitted to close when the magnet is energized. Otherwise the operations will be the same as above described.

Having described only the preferred embodiments of the invention, many modifications of the mechanism and methods of applying the same will suggest themselves to those skilled in the art, all within the scope of the appended claims. Accordingly what is desired to be secured by Letters Patent and claimed as new is:—

1. In a selective system; a magnet; a selecting mechanism controlled by said magnet; a motor supplying operating energy to said selecting mechanism; and means controlled by said magnet for controlling the supply of energy to said motor.
2. The combination as set forth in claim 1 in which said selecting mechanism comprises a plurality of selectable members, one of said selectable members being arranged to actuate said motor control means.
3. In a selecting system, a magnet; a selecting mechanism comprising a plurality of selectable members; solely and entirely mechanical means controlled by said magnet and controlling said selectable members; a motor supplying actuating energy to said selecting mechanism; and means controlled by one of said selectable members for controlling the energy supply to said motor.
4. In combination, a selecting mechanism comprising a plurality of selectable actuating bars, a drive motor for said selecting mechanism, and control means for said motor operated by one of said actuating bars.
5. The combination as set forth in claim 4 in which said selecting mechanism comprises a single control magnet for controlling said selectable actuating bars.

6. The combination as set forth in claim 4 together with additional means controlled by said magnet for controlling said motor control means.
7. In combination, a selecting mechanism comprising a plurality of selectable actuating bars; a drive motor for said selecting mechanism; control means for said motor operated by one of said actuating bars; and an additional control means for said motor comprising a pair of contacts in the motor supply circuit controlled by said selecting mechanism.
8. The combination as set forth in claim 7 in which said additional means controlled by the magnet comprises means for locking the contacts in operated position.
9. In a printing telegraph system, a selecting mechanism comprising a plurality of notched selector bars movable in combination to selectively align the notches contained therein; a motor; a supply circuit for said motor; contacts in said supply circuit; operating means controlling said contacts comprising a bar movable into a set of said aligned notches controlled by selector mechanism to open said contacts; and additional means for controlling said contact operating means.
10. The combination as set forth in claim 9 in which said additional means comprises means for holding said contacts open to stop the motor, and for permitting said contacts to close to start the motor.
11. A printing telegraph receiver comprising a selecting mechanism responsive to received combinations of electrical conditions to effect printing, a bell, selectable operating means for said bell controlled by said selecting mechanism, a motor, and control means for said motor operated by said bell operating means.
12. In a printing telegraph receiver comprising a single magnet selecting mechanism and a shift mechanism, a motor, and means for stopping said motor under the combined control of said selecting and said shift mechanisms.
13. The combination as set forth in claim 12 together with means for starting said motor under the control of said selecting mechanism, independently of said shift mechanism.
14. The combination as set forth in claim 12 in which said motor stopping means comprises contacts in said motor circuit controlled by said selecting mechanism and said shift mechanism.
15. In a printing telegraph system, the method of control which comprises the transmission of a main set of signals to indicate to an attendant the kind of action required, and simultaneously transmitting auxiliary signals to indicate the circuit requiring the action.
16. The method as set forth in claim 15 in which the auxiliary signals are utilized to indicate whether the requirement for action is immediate.
17. In a printing telegraph system, comprising a selecting mechanism and a shift mechanism, a signal, means for energizing said signal in unactuated position of said shift mechanism, and means for preventing energization of said signal in actuated position of said shift mechanism.
18. In a printing telegraph system comprising a plurality of transmitters; a receiving station comprising a plurality of printing telegraph receivers responsive to said transmitters; main signalling means individual to each receiver to indicate to a common attendant for said receivers the kind of action required by the receiver; and auxiliary signalling means to indicate the receiver requiring the action.
19. The combination as set forth in claim 18 in which said main signalling means comprises a bell; and said auxiliary signalling means comprises a lamp.
20. The combination as set forth in claim 19 together with means for operating said auxiliary signalling means to indicate whether the requirement for action is immediate.
- In testimony whereof we affix our signatures.

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