Nov. 4, 1958 H. W. KLOID 2,858,922

TYPING SYSTEM

Filed Jan. 5, 1956 2 Sheets-Sheet 1

Fig. 1.

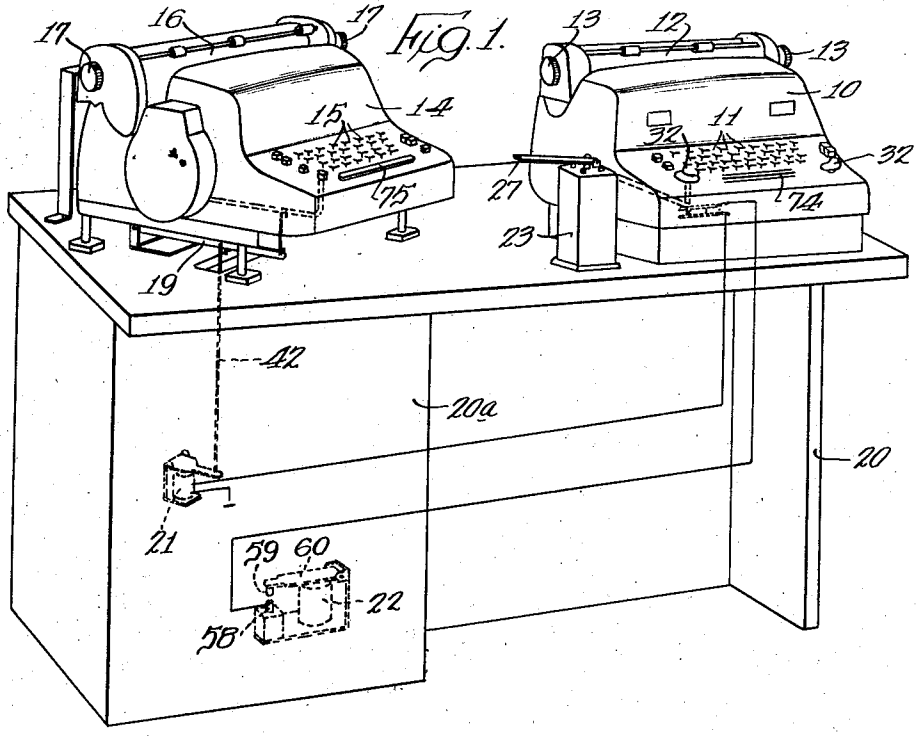


Fig. 2.

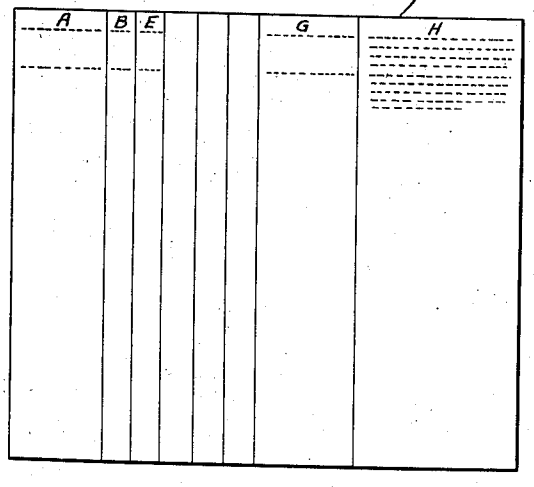
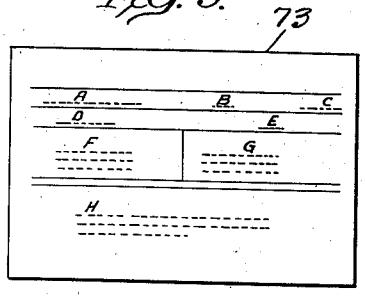


Fig. 3.



INVENTOR.
Henry W. Kloid
BY Schroeder, Hofgren, Brady & Wegner.
Attys.

Nov. 4, 1958 H. W. KLOID 2,858,922

TYPING SYSTEM

Filed Jan. 5, 1956 2 Sheets-Sheet 2

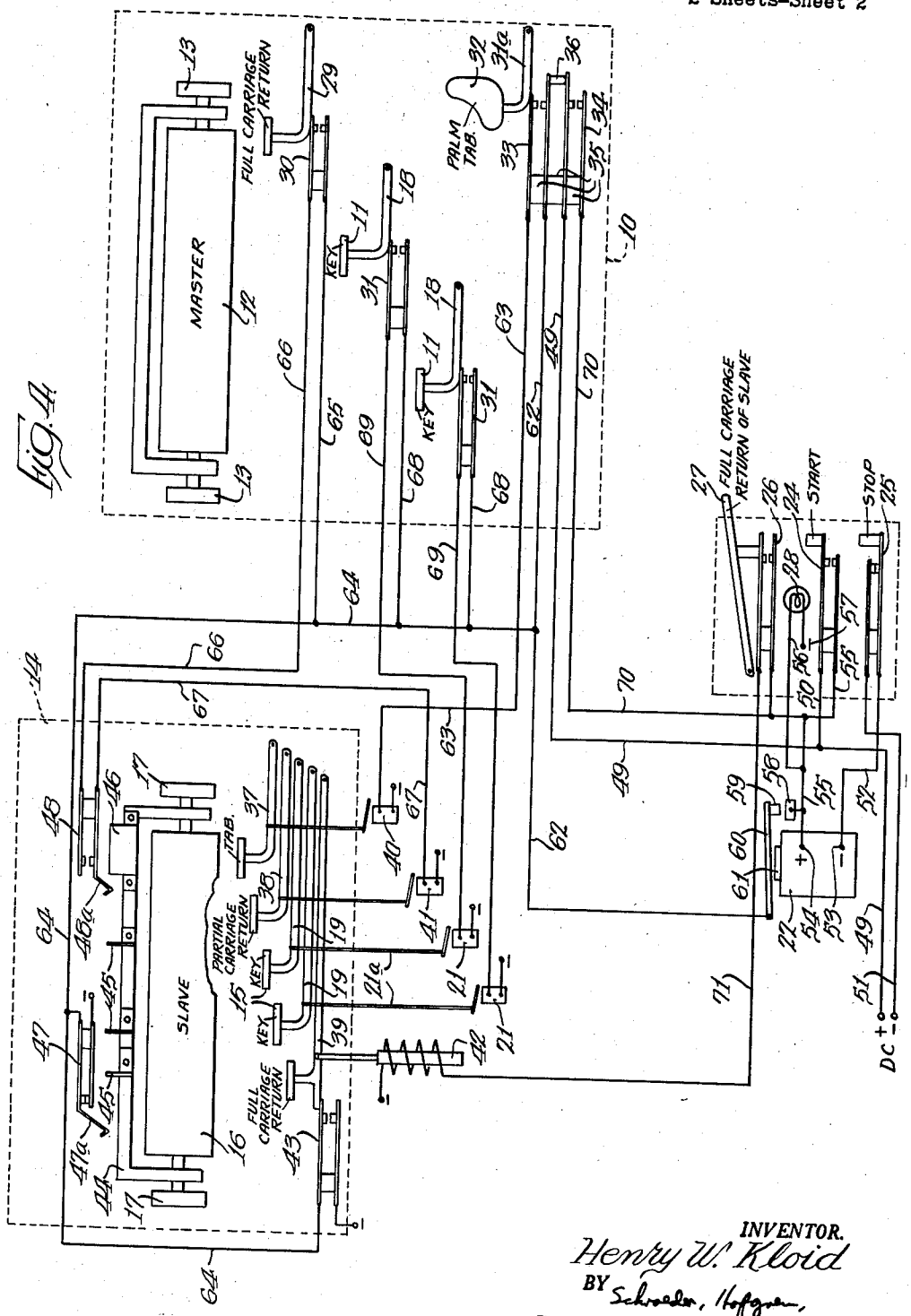


Fig. 4

INVENTOR.
Henry W. Kloid
BY Schroeder, Hoffman, Brady & Wagner.
Attys.

United States Patent Office 2,858,922
Patented Nov. 4, 1958

2,858,922

TYPING SYSTEM

Henry W. Kloid, Glenview, Ill., assignor to American Automatic Typewriter Company, a corporation of Illinois

Application January 5, 1956, Serial No. 557,534

8 Claims. (Cl. 197—5)

This invention relates to a record keeping system which has a typing apparatus.

One of the features of this invention is to provide an improved record keeping system such as a typing apparatus, comprising a master typewriter having a plurality of type operating keys, a slave typewriter having a plurality of type operating levers, means operable by the activation of a key on the master for activation of a similar lever on the slave for simultaneous typing of similar matter on both typewriters, means for automatically preventing operation of only the slave at a predetermined point in the typing, and means for resuming operation of the slave subsequently thereto.

Another feature of the invention is the provision of such an apparatus in which means are provided for returning the carriage of the master typewriter for beginning typing on a new line together with means for simultaneously returning the carriage of the slave typewriter either the full distance to the beginning of a new line or only a predetermined partial distance to a point short of the beginning of the full line.

Other features and advantages of the invention will be apparent from the following description of one embodiment thereof taken in conjunction with the accompanying drawings. Of the drawings:

Figure 1 is a perspective view of one embodiment of the invention.

Figure 2 is an elevation of a specimen record sheet of paper as typed in the slave typewriter.

Figure 3 is an elevation of a specimen sheet of paper as typed simultaneously in the master typewriter.

Figure 4 is a diagrammatic view illustrating in simplified form the wiring circuit of the typing apparatus of this invention.

The apparatus of this invention as shown in the accompanying drawings comprises a master electric typewriter **10** including the usual type operating keys **11**, paper carrying carriage **12**, and rotating knobs therefor **13**. The apparatus also includes a slave typewriter **14**, both the master and the slave typewriters being of the electric type. Again, the slave typewriter includes the usual type operating keys **15**, carriage **16**, and carriage rotating knobs **17**. Each key **11** and **15** operates a type activating lever **18** and **19**, respectively. For simplicity of illustration in Figure 4 only two type operating keys are shown for each of the master and slave typewriters.

The master **10** and slave **14** typewriters are mounted side by side on a desk **20** for easy access thereto. The desk beneath the slave typewriter **14** is enclosed as indicated at **20***a* in order to provide for the principal operating mechanism for the slave typewriter **14**. This operating mechanism includes a plurality of solenoids **21**, **40**, **41** and **42** of which only solenoid **21** is shown in Figure 1 for simplicity of illustration and only four are shown in Figure 4 for the same reason. Each type operating lever **19** and operating key on the slave typewriter **14** is provided with such a solenoid. Also mounted within the enclosure **20***a* is a locking relay **22** adapted

to open and close the electric circuit to the solenoids and other operating devices of the slave typewriter **14**.

Mounted on top of the desk **20** adjacent to the master typewriter **10** for ready access by typists operating the master typewriter, there is provided a control box **23**. This control box includes a starting switch **24** for starting operation of the slave typewriter, a stopping switch **25** for stopping the operation on the slave typewriter, and a switch **26** having an extended arm **27** for easy operation for returning the carriage **16** of the slave to the beginning of a typing line. The function and operation of this full carriage return switch **26** will be described in detail later. The control box **23** also carries an indicating device such as a lamp **28** to show when the locking relay **22** is open and closed.

The master typewriter **10** includes a full carriage return lever **29**, which when depressed closes a switch **30**. The master typewriter levers **18** are also arranged to close normally open switches **31** when the keys of the master typewriter are struck during the normal typing operation. These switches **30** and **31** are, of course, in addition to the typing switches that are customarily provided for electric typewriters. In other words, the circuit illustrated in Figure 4 is in addition to that supplied in conventional electric typewriters as these conventional circuits are not changed in this invention. In fact, except as hereinafter specified, each of the master typewriter **10** and slave typewriter **14** functions and types in the purely functional fashion of electric typewriters.

The master typewriter **10** is also provided with a special tabulator lever **31***a* that operates as a conventional tabulator on this master typewriter.

This tabulator lever **31***a* has a key portion **32** that is adapted to be struck by the palm of the hand of the typist operating the master typewriter. This tabulator lever **31***a* is arranged to close a pair of normally open switches **33** and **34** that are simultaneously closed when the lever **31***a* is depressed. Each of the switches **33** and **34** are insulated from each other by insulating blocks **35** and **36**. The block **36** functions to cause switches **33** and **34** to close and open substantially simultaneously.

The slave typewriter **14** includes a tabulator lever **37**, a partial carriage return lever **38**, and a full carriage return lever **39**. Operably attached to the tabulator lever **37** is a solenoid **40**, operably attached to the partial carriage return lever **38** is a solenoid **41**, and operably attached to the full carriage return lever **39** is a solenoid **42**. Each of solenoids **21** is attached to its respective type bar operating lever **19** by means of a mechanical linkage **21***a*. A switch **43** that is normally open is adapted to be closed by movement of the full carriage return lever **39**.

Mounted on the slave typewriter carriage **16** for movement therewith is a bar **44** carrying spaced projections **45**. Also mounted on the bar **44** for movement therewith is an elongated block **46**. Arranged adjacent to the bar **44** is a normally closed switch **47** adapted to be opened by contact of the successive projections **45** with an operating arm **47***a* of the switch. Also arranged adjacent to the bar **44** is a normally open switch **48** adapted to be closed by contact of an operating arm **48***a* of the switch with the block **46**.

The current supplied to the illustrated apparatus is direct current. An electric lead **49** from the positive side of a direct current source leads to one side of the switch **34**. This lead **49** is connected through a lead **50** to one side of the normally open starting switch **24**. The negative side of the direct current power source is connected by means of electric lead **51** to one side of the normally closed stop switch **25**. The other side of this stop switch is connected through a lead **52** to the negative post **53** on

the locking relay 22. The positive post 54 of this relay is connected by means of an electric lead 55 to the opposite side of the starting switch 24. This lead 55 is also connected by means of a lead 56 to the indicating lamp 28. The other side of this lamp 28 is electrically connected to the negative power source. In order to simplify the wiring diagram, this connection to the negative lead is illustrated diagrammatically throughout Figure 4 by indicating a negative connection as illustrated at 57.

The electric lead 55 from the positive post 54 on the holding relay 22 is connected to a contact 58 that is adapted to be engaged by a contact 59 on a movable arm 60. This movable arm 60 is arranged adjacent to the armature 61 of the holding relay 22 so that when current is flowing through the relay 22, the arm 60 will be attracted toward the armature 61 so that the contacts 58 and 59 will complete the circuit through the arm 60. As the relay 22 is of the holding type having the usual internal construction features, this contact will be maintained until the current through the relay 22 is interrupted.

Attached to the electrically conducting arm 60 is an electric lead 62 extending to one side of the switch 33. The other side of this switch 33 is connected by an electric lead 63 to one side of the solenoid 40 that operates the slave typewriter tabulator lever 37. The other side of this solenoid 40 is connected to the negative side of the direct current source.

The lead 62 from the holding relay 22 is connected by means of an electric lead 64 to one side of the switch 43 that is adapted to be closed by the slave typewriter full carriage return lever 39. The other side of this switch 43 is connected as indicated to the negative side of the direct current source.

Connected to the electric lead 64 by an electric lead 65 is one side of the switch 30 that is operated by the master carriage return lever 29. The other side of this switch 30 is connected by an electric lead 66 to one side of the normally open slave switch 48. The other side of switch 48 is connected by means of an electric lead 67 to one side of the solenoid 41 that operates the partial carriage return lever 38. The other side of solenoid 41 is connected to the negative side of the direct current supply.

Also connected to the positive electric lead 64 are a series of electric leads 68 each leading to one side of the master key operated switches 31. The other side of each master key switch 31 is connected by means of an electric lead 69 to a solenoid 21 on the slave typewriter which operates a key lever 19 that is similar to the corresponding lever 18 on the master typewriter. Thus, for example, if the master key 11 operates the letter "A" on the master typewriter, this operation of the lever closes the switch 31 to operate a solenoid 21 to activate the "A" lever 19 on the slave typewriter. For the other letters and symbols of the master typewriter, the same arrangement is provided.

Attached to the electric lead 55 leading from the positive post 54 on the relay is an electric lead 70 extending to the side of the switch 34 that is opposite to the lead 49. Also connected to this lead 70 is one side of the full carriage return switch 26 of the slave. The other side of this normally open switch is connected by means of an electric lead 71 to the solenoid 42 which operates the full slave carriage return.

Figures 2 and 3 illustrate records that may be typed simultaneously on the slave typewriter and on the master typewriter of this invention. The paper 72 shown in Figure 2 is adapted to be typed on the slave typewriter 14. Similarly, the paper 73 shown in Figure 3 is adapted to be typed on the master typewriter 10. In each instance, the respective paper is inserted in the typewriter in the customary manner to be held by the respective carriages 12 and 16. As can be seen, the master typewriter paper 73 has spaces A, B, C, D, E, F, G, and H for typing data and information. The slave typewriter paper 72 has spaces A, B, E, G, and H, thus omitting data that is typed in spaces C, D, and F on paper 73.

When beginning the operator inserts paper 73 in the master typewriter 10 and paper 72 in the slave typewriter 14 in the customary manner. The respective carriages 12 and 16 are moved to the beginning of their paths of travel in the customary manner. The circuit is then turned on by closing the starting switch 24. This closing of the starting switch 24 provides current through negative lead 51, normally closed switch 25, and lead 52 to the negative connection 53 on the relay 22. It also provides positive current through the lead 49, lead 50, switch 24, and lead 55 to the positive connection 54 on the relay 22. This current flow through the holding relay 22 then causes the arm 60 to be attracted toward the armature 61 and causes contacts 58 and 59 to close. As the relay is a holding relay, these contacts will remain closed until current flow through the relay 22 is interrupted.

The data is then typed on space A of paper 73 by operating keys 11 of the master typewriter 10 in the usual manner. The depression of each key 11 closes the corresponding switch 31 so that current flows from the electric leads 62 and 64 through leads 68 and 69 to a corresponding solenoid 21 on the slave typewriter 14. The current flow through the corresponding solenoid 21 operates the corresponding key lever 19 on the slave typewriter to type the same letter or symbol in the space A on the paper 72 in the slave. Typing is continued in this manner simultaneously in the space A on papers 72 and 73 until this space has been filled. During this operation of the master and slave typewriters, the carriages 12 and 16 move in the customary manner.

As soon as space B on paper 73 in the master has been reached and the space B in the slave paper 72 has similarly been reached, the data is typed in this space in the same manner.

As soon as this has been completed, the carriage 12 of the master typewriter is moved further toward the end of this line of travel until the space C is lined up with the typing position of the type bars so that data can be typed in this space. This continued movement of the master carriage 12 is brought about by the usual operation of the master keys 11 or the master space bar 74. This space bar 74, although not specifically illustrated, is provided with a switch similar to switch 31 and a solenoid similar to solenoid 21 to operate the corresponding space bar 75 on the slave.

When the spacing is such that space C on paper 73 is available for typing on a master typewriter, the first projection 45 on the bar 44 mounted on the slave carriage 16 has moved until the projection contacts the switch arm 47*a* and opens the switch 47. This opening of the switch 47 interrupts the current to the holding relay 22 so that the arm 60 can immediately be released to separate the contact points 58 and 59 and thus break the circuit to the slave typewriter 14. The indicating light 28 immediately goes off. The data is then typed in the space C on the master paper 73 and there is no corresponding operation of the slave typewriter 14.

Then in order to type in the space D on the master paper 73, the full carriage return lever 29 on the master typewriter is depressed to return the carriage to the beginning of the next line. As the normally open switch 48 on the slave typewriter 14 is open and as current is still interrupted to the slave typewriter, this will have no effect on the carriage movement of the slave typewriter. Data is then typed in the space D on the paper 73 in the master typewriter 10.

In order to type in the space E in the master paper 73, the master typewriter is operated in the manner above described. As this similar data is also typed on the paper 72 in the space E in the slave typewriter, it is necessary to move the slave carriage 16 until the first projection 45 is out of contact with the switch arm 47*a* so that the switch 47 may be closed. This is done by the operator depress-

ing the palm tabulator key 32. This depressing of the palm tabulator key 32 closes switches 33 and 34. The closing of switch 34 again provides current to the holding relay 22 through the electric leads 51 and 52 and through the electric leads 49, 70, and 55. The contacts 58 and 59 are then closed and remain closed until current flow to the relay 22 is again interrupted. This current flow through the relay 22 is indicated by the light 28 going on again.

Closing of the switch 33 sets up current flow by means of leads 62 and 63 through solenoid 40. This operates the tabulator key 37 which operates in the customary manner to move the carriage 16 so that the space E on paper 72 is then positioned to be struck by the type bar. Then when data is typed in space E on master paper 73, this same data is typed in space E on slave paper 72. As soon as data in space E on both pages has been inserted, the space bar 74 on the master typewriter is struck a sufficient number of times to cause the carriage 16 of the slave typewriter to move to a point where the second projection 45 on the bar 44 again opens the switch 47. This again interrupts current flow to the relay 22 so that the circuit to the slave is again broken, the contacts 58 and 59 separated, and the indicator light 28 turned off in the manner previously explained.

When this has occurred, the carriage return lever 29 on the master is again struck to return the carriage to the beginning of its operation so that the space F on the master paper 73 is available for typing. Data is then typed in this space as indicated in Figure 3. However, as current flow to the slave typewriter has been interrupted, there will be no corresponding typing by the slave typewriter.

As soon as the typing in the space F on the master paper 73 has been completed, the palm tabulator key 32 is again struck. Once more this moves the slave carriage 16 until the second projection 45 no longer contacts the switch arm 47*a* and the switch 47 is again closed. At the same time, the operation of this palm tabulator lever moves the master carriage 12 a sufficient distance so that the space G is available for typing. Data is then typed simultaneously in the space G of the master paper 73 and slave paper 72 in the manner described.

When the typing in the space G has been completed, the carriage return lever 29 is then depressed to return the master carriage 12 to the beginning of the next line. Data in the first line of the space H is typed in on the master typewriter 10 and simultaneously in the space H on the slave typewriter 14 in the same manner as previously described. Upon approaching the end of a line on the slave typewriter, the block 46, which is of predetermined length and location, contacts switch arm 48*a* and closes this switch 48. Then when this first line in the space H on the slave paper 73 has been completed, the master carriage return lever 29 is depressed. This returns the master carriage the full distance to the beginning of the next line. The depression of the lever 29 on the master closes the switch 30, and as the switch 48 is closed by the block 46 pressing on the arm 48*a*, current flows from the positive lead 64 through leads 65 and 66, switch 48, and lead 67 through solenoid 41. This current flow through solenoid 41 depresses the partial carriage return lever 38 on the slave typewriter 14. This partial carriage return lever only returns the carriage of the slave typewriter a distance equivalent to the time the electric contact is closed. As soon as this electric contact is open, return movement of the slave carriage 16 stops. Because of this, the slave carriage 16 is returned only a distance equivalent to the length of the block 46 because as soon as the block 46 moves out of contact with the switch arm 48*a* so that the switch 48 is open, current flow into the solenoid 41 is stopped, the partial carriage return lever 38 is released, and return movement of the carriage is stopped. At this point, the carriage is in position for typing on the next line in the space H of slave paper 72.

Thus, with this arrangement, the operation of the carriage return lever 29 on the master returns the master carriage 12 the full distance to the beginning of its line, but returns the slave carriage 16 only a partial distance to a predetermined position dependent upon the length of the block 46 and the relative position of the switch 48 and switch arm 48*a*.

The internal construction and wiring of the master and slave electric typewriters have the usual wiring for such electric typewriters. The only additions and changes in this wiring are as indicated herein and as shown in the drawings.

As soon as all data has been typed on the paper 73 and 72, the circuit is broken by opening the normally closed stop switch 25. This opening of the switch 25 interrupts the current flow to the relay 22, thereby releasing the arm 60 to separate the contact points 58 and 59 in the manner previously described.

Each of the switches 30, 31, 33, 34, 43, 47, 48, 24, and 26 is of the customary spring arm construction. Furthermore, the arm 60 of the holding relay is spring urged to open position as is customary in holding relays of this type.

In the embodiment shown, the slave typewriter 14 has a separate full carriage return provision. This full carriage return is provided by the switch 26, which is normally open but which is adapted to be closed by the lever 27. As soon as the switch 26 is closed, current flows through lead 55, switch 26, and lead 71 to the solenoid 42. This causes movement of the solenoid to depress the full carriage return lever 39. This movement also closes switch 43, which is in parallel with the switch 47 that is contacted by the projection 45. As the switches 43 and 47 are in parallel, the current flow to the holding relay 22 is not interrupted in spite of the fact that switch 47 is successively opened and closed by projections 45 contacting switch arm 47*a*. However, as soon as the full slave carriage return lever 39 is released, this opens switch 43 so that switch 47 is again operative to interrupt current flow to the holding relay when the projections 45 contact the switch arm 47*a* in the manner specified.

Having described my invention as related to the embodiment shown in the accompanying drawings, it is my intention that the invention be not limited by any of the details of description, unless otherwise specified, but rather be construed broadly within its spirit and scope as set out in the accompanying claims.

I claim:

1. A typing apparatus, comprising: a master typewriter having a plurality of type operating keys; a slave typewriter having a carriage and a plurality of type operating levers; an electrical circuit; a first switch in said circuit closed by the activation of a key of said master; a solenoid in the portion of said circuit that includes the first switch operably connected to a lever on the slave for typing matter on said slave similar to the matter typed on said master upon activation of said key; means for opening said circuit at a predetermined point in the operation of said slave; and manually operable means for closing said portion of the circuit including said first switch and solenoid and simultaneously moving said slave carriage to a new position relative to the slave typewriter.

2. A typing apparatus, comprising: a master typewriter having a plurality of type operating keys; a slave typewriter having a carriage and a plurality of type operating levers; an electrical circuit; a first switch in said circuit closed by the activation of a key of said master; a holding relay switch in a portion of said circuit; a second switch for closing said relay switch to close said circuit; a solenoid in the portion of said circuit that includes the first switch operably connected to a lever on the slave for typing matter on said slave similar to the matter typed on said master upon activation of said key; a third switch in said circuit; means on said slave carriage engaging

said third switch at a predetermined point in the travel of said slave carriage for opening said circuit and releasing the holding relay in order to prevent operation of said slave; a tabulator lever on said slave; a solenoid in a portion of said circuit operably connected to the tabulator lever for operation thereof upon activation of the solenoid; a normally open fourth switch in said circuit to the solenoid; a normally open fifth switch in the relay portion of the circuit; and means for closing said fourth and fifth switches for operating said slave tabulator lever to move the slave carriage to a new position and re-energize said relay.

3. A typing apparatus, comprising: a master typewriter having a plurality of type operating keys; a slave typewriter having a carriage and a plurality of type operating levers; an electrical circuit; a plurality of first switches in said electrical circuit each adapted to be closed by the activation of one of said keys of the master; a plurality of solenoids in said circuit each in a portion of the circuit including one of said first switches, each solenoid being operably connected to a lever on the slave for typing matter on the slave similar to the matter typed on said master upon activation of said keys; a holding relay switch electrically connected in the portions of said circuit including said solenoids for interrupting and closing the circuit to said solenoids upon opening and closing of said relay switch; a second switch for closing said relay switch to close said circuit; a normally closed third switch in the circuit to said relay switch; means on said slave carriage engaging said third switch at a predetermined point in the travel of said slave carriage for opening said relay switch circuit to prevent operation of said solenoids; a tabulator lever on said slave; a solenoid in a portion of said circuit operably connected to the tabulator lever for operation thereof upon activation of the solenoid; a normally open fourth switch in said circuit to the solenoid; a normally open fifth switch in the relay portion of the circuit; and means for closing said fourth and fifth switches for operating said slave tabulator lever to move the slave carriage to a new position and re-energize said relay.

4. A typing apparatus, comprising: a master typewriter having a plurality of type operating keys; a slave typewriter having a carriage and a plurality of type operating levers; an electrical circuit; means operable by the activation of a key on the master for activation of a similar lever on the slave for simultaneously typing similar matter on both typewriters; a carriage return key on said master; a carriage return switch in said circuit operable by said return key; a normally open slave switch in the portion of said circuit that includes said carriage return switch; means for closing said slave switch only while the slave carriage is travelling through a predetermined portion of its path of travel; a solenoid in the portion of the circuit including said carriage return switch and slave switch; a partial return lever on said slave operable to return the slave carriage only so long as said partial return lever is activated; and means operably connecting the solenoid and partial return lever for operation of said lever upon energization of said solenoid.

5. A typing apparatus, comprising: a master typewriter having a plurality of type operating keys; a slave typewriter having a carriage and a plurality of type operating levers; an electrical circuit; a first switch in said circuit closed by the activation of a key of said master; a holding relay switch in a portion of said circuit; a second switch for closing said relay switch to close said circuit; a solenoid in the portion of said circuit that includes the first swtich operably connected to a lever on the slave for typing matter on said slave similar to the matter typed on said master upon activation of said key; a third switch in said circuit; means on said slave carriage engaging said third switch at a predetermined point in the travel of said slave carriage for opening said circuit and releasing the holding relay in order to prevent operation of said slave; a normally open full carriage return switch in said circuit; a full carriage return lever on said slave operable to return the carriage to the beginning of its path of travel upon activation of said lever; a solenoid in the portion of the circuit including said carriage return switch operably connected to the full carriage return lever for operation thereof upon closing of said carriage return switch; a normally open fourth switch connected in parallel in the portion of the circuit including said third switch to keep said portions of the circuit closed when the third switch is open and the fourth switch closed in order to cause full return of the carriage; and means operably connecting the fourth switch and full carriage return lever for closing said fourth switch upon operation of said lever.

6. A typing apparatus, comprising: a master typewriter having a plurality of type operating keys; a slave typewriter having a carriage and a plurality of type operating levers; an electrical circuit; a first switch in said circuit closed by the activation of a key of said master; a holding relay switch in a portion of said circuit; a second switch for closing said relay switch to close said circuit; a solenoid in the portion of said circuit that includes the first switch operably connected to a lever on the slave for typing matter on said slave similar to the matter typed on said master upon activation of said key; a third switch in said circuit; means on said slave carriage engaging said third switch at a predetermined point in the travel of said slave carriage for opening said circuit and releasing the holding relay in order to prevent operation of said slave; a normally open full carriage return switch in said circuit; a full carriage return lever on said slave operable to return the carriage to the beginning of its path of travel upon activation of said lever; a solenoid in the portion of the circuit including said carriage return switch operably connected to the full carriage return lever for operation thereof upon closing of said carriage return switch; a tabulator lever on said slave; a solenoid in a portion of said circuit operably connected to the tabulator lever for operation thereof upon activation of the solenoid; a normally open fourth switch in said circuit to the solenoid; a normally open fifth switch in the relay portion of the circuit; means for closing said fourth and fifth switches for operating said slave tabulator lever to move the slave carriage to a new position and re-energize said relay; a normally open sixth switch connected in parallel in the portion of the circuit including said third switch to keep said portions of the circuit closed when the third switch is open and the sixth switch closed in order to cause full return of the carriage; and means operably connecting the sixth switch and full carriage return lever for closing said sixth switch upon operation of said lever.

7. A typing apparatus, comprising: a master typewriter having a plurality of type operating keys; a slave typewriter having a carriage and a plurality of type operating levers; an electrical circuit; a plurality of first switches in said electrical circuit each adapted to be closed by the activation of one of said keys of the master; a plurality of solenoids in said circuit each in a portion of the circuit including one of said first switches, each solenoid being operably connected to a lever on the slave for typing matter on the slave similar to the matter typed on said master upon activation of said keys; a holding relay switch electrically connected in the portions of said circuit including said solenoids for interrupting and closing the circuit to said solenoids upon opening and closing of said relay switch; a second switch for closing said relay switch to close said circuit; a normally closed third switch in the circuit to said relay switch; means on said slave carriage engaging said third switch at a predetermined point in the travel of said slave carriage for opening said relay switch circuit to prevent operation

of said solenoids; a tabulator lever on said slave; a solenoid in a portion of said circuit operably connected to the tabulator lever for operation thereof upon activation of the solenoid; a normally open fourth switch in said circuit to the solenoid; a normally open fifth switch in the relay portion of the circuit; means for closing said fourth and fifth switches for operating said slave tabulator lever to move the slave carriage to a new position and re-energize said relay; a carriage return key on said master; a carriage return switch in said circuit operable by said return key; a normally open slave switch in the portion of said circuit that includes said carriage return switch; means for closing said slave switch only while the slave carriage is travelling through a predetermined portion of its path of travel; a solenoid in the portion of the circuit including said carriage return switch and slave switch; a partial return lever on said slave operable to return the slave carriage only so long as said partial return lever is activated; means operably connecting the solenoid and partial return lever for operation of said lever upon energization of said solenoid; a normally open full carriage return switch in said circuit; a full carriage return lever on said slave operable to return the carriage to the beginning of its path of travel upon activation of said lever; a solenoid in the portion of the circuit including said carriage return switch operably connected to the full carriage return lever for operation thereof upon closing of said carriage return switch; a normally open sixth switch connected in parallel in the portion of the circuit including said third switch to keep said portions of the circuit closed when the third switch is open and the sixth switch closed in order to cause full return of the carriage; and means operably connecting the sixth switch and full carriage return lever for closing said sixth switch upon operation of said lever.

8. A typing apparatus, comprising: a master typewriter having a plurality of type operating keys; a slave typewriter having a carriage and a plurality of type operating levers; an electrical circuit; means operable by the activation of a key on the master for activation of a similar lever on the slave for simultaneously typing similar matter on both typewriters; means for opening said circuit at a predetermined point in the operation of said slave to prevent the operation of said slave; a normally open full carriage return switch in said circuit; a full carriage return lever on said slave operable to return the carriage to the beginning of its path of travel upon activation of said lever; means in the portion of said circuit including said second means to keep said portion of the circuit closed when said second means is open and said third means is closed in order to cause full return of the carriage; means operably connecting said third means and said full carriage return lever for closing said third means upon operation of said lever; and a solenoid in the portion of the circuit including said carriage return switch operably connected to the full carriage return lever for operation thereof upon closing of said carriage return switch.

References Cited in the file of this patent

UNITED STATES PATENTS

1,239,466	Dennis	Sept. 11, 1917
1,520,478	More	Dec. 23, 1924