SERVICE MANUAL

and

PARTS PRICE LIST

SEEBURG

WIRED REMOTE CONTROL SYSTEM

APPLIED TO

SEEBURG SYMPHONOLAS

J. P. SEEBURG CORPORATION

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FOREWORD

This manual has been compiled for the service engineer in making any adjustment and repairs that may be necessary on the SEEBURG WIRED REMOTE CONTROL SYSTEM.

In preparing this manual every effort was made to present the material in the simplest form possible. One should not attempt to do any servicing until he has studied the entire manual and thoroughly understands the information therein.

It is the desire of every manufacturer to make a product as nearly perfect as possible. Any mechanism, whether the human body or a man-made machine, will require servicing and the more skilled the service man in either case, the more simple the operation. The SEEBURG WIRED REMOTE CONTROL SYSTEM is simply a mechanical device electrically operated and based upon fundamentals of electricity and mechanics. It represents the more simple form of remote controlled phonographs.

In the repair of any machine, it is absolutely necessary that the theory of operation be understood. One should not attempt to service any mechanical or electrical device without first familiarizing oneself with the fundamentals governing the mechanism. We cannot over-emphasize the importance of carefully studying the various components of the WIRED REMOTE CONTROL SYSTEM herein described before attempting to service any part, otherwise complications may arise necessitating additional expense and loss of time.

Seeburg maintains a nation-wide organization of field engineers to instruct and cooperate with your service department. You will find these men up-to-date on all information pertaining to service. In addition, we maintain a home service department at the factory to help you and to furnish any technical or service information desired.

When requesting information by wire or letter relative to the WIRED REMOTE CONTROL SYSTEM, please give model and serial number of the unit in question. Also please give a full description of the problem encountered so that we may be better able to serve you.

This manual will be supplemented from time to time with service bulletins.

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WIRED REMOTE CONTROL

The Wired Remote Control is a system for making selections in a Symphonola from a remote point in the establishment by means of a cable which connects the wall box or boxes to the Symphonola. This cable contains 25 conductors, each of which provides a path for the electric current to travel from the Selector buttons in the wired selector or wall box to the Selector solenoid in the Symphonola. Each of the 20 buttons in the Wired Selector is connected to its corresponding solenoid by one of the above mentioned cable conductors. In other words, for 20 wired selector buttons we must have 20 conductors from the wired selector to the Symphonola. These 20 conductors take care of the selector circuits. The remaining five conductors in the cable are for miscellaneous circuits such as illuminating lamps, etc.

The Wired Remote Control system comprises three major units, namely; Power Supply, Solenoid Drum and Wired Selectors. All of these units are the Wired Remote Control type and are not interchangeable with the Wall-O-Matic Remote Control Unit. A brief description of each unit follows:

I. POWER SUPPLY UNIT:

The Power Supply Unit (Fig. 5) contains the power transformer, auxilliary magazine relay, two cable sockets, light switch, wired selector cable and a fuse for protection of the transformer. This unit reduces the line voltage from 115 volts, 50-60 cycle to 25 volts, which is used to operate the various relays and solenoids in the Wired Remote Control system. It also provides power for the illuminating lamps in the Wired Selector unit. The light

switch provides a means of turning off the illuminating lamps in all Wired Selectors when so desired without disturbing the system's ability to make selections. A fuse is placed in the primary circuit of the power transformer for protection and when necessary to replace it, a fuse of exactly the same rating must be used.

2. WIRED SOLENOID DRUM:

The Wired Solenoid Drum is mounted on the Symphonola mechanism and contains the previously mentioned 20 selector solenoids and it is through this unit that the Symphonola mechanism is caused to pick the desired record corresponding to the buttons pushed in the wired selector.

3. WIRED SELECTOR:

The Wired Selector is that part of the system from which selections are made at some remote or distant point in the establishment. The entire unit is housed in a single piece die casting. Figure 4 shows in detail the assembly of the Wired Selector with its housing removed. Figure 8 shows in detail the housing assembly. The two units are held together by means of a screw-on type of lock (Item 11, Fig. 8) and the housing can be removed only by the use of a key which permits the unscrewing of the lock.

THEORY AND OPERATION

Figure No. 2 is a complete Schematic Wiring diagram of the Wired Remote Control System. Examination of this diagram shows that conductors 1 to 20 inclusive of Wired Selector Cable M19 and Interconnecting Cable M20 carry the individual circuits from the Wired Selectors to the Wired Solenoid Drum, which is turn causes the Symphonola mechanism to pick the desired selection. Note that the Interconnecting Cable M20 terminates on Cable Plug M14 and Wired Selector Cable M19 terminates on Cable Socket M13 at one end, the other end on the Solenoid Drum.

Cable Plug M14 and Cable Socket M13 provides an easy and quick method of disconnecting the Wired Selectors from the Symphonola without disturbing the wiring of either unit in case the Symphonola has to be removed for service and repairs.

Selector Switches M1 are of the momentary contact type, i.e. contact is made only while any plunger is depressed and contact is broken as soon as pressure is released. The switches are also arranged so that only one selector circuit is effective at any one instant in case two buttons are depressed at the same time. The instant that the buttons are depressed the circuit is broken and the selection on the even numbered switch will be made, i.e. suppose that button No. 13 and button No. 2 were pushed simultaneously, selection No. 2 would result. However, if buttons No. 3 and No. 13 were pushed then selection No. 13 would result, or if buttons No. 2 and No. 20 were pushed selection No. 20 would be made. This condition is due to the wiring of the Selector switches M1, where all the odd numbers are on one side and all even numbers on the other.

So far we have only considered 20 conductors in the cable, the remaining 5 conductors are for miscellaneous circuits.

The illuminating lamps are wired in series and all lamps must be in the sockets otherwise the lamps will not light. Also, if any one lamp burns out the other lamps will go out also. The illuminating lamps are supplied with power over conductors No. 22 and No. 23 of Cable M20 through switch M22, which is located in the Symphonola and is used to turn off the illumination in the Wired Selectors when desired. This does not affect the selection of records or otherwise disturb the operation of the system. Switch M22 controls the lights in all the Wired Selectors in any one system.

The system is so arranged that in case a coin is dropped in a Wired Selector before the Symphonola has been turned on, the mechanism in the Wired Selector will register the credit and the desired selection can be made immediately but it will not be played until the power has been turned on in the Symphonola.

This holds true if the Symphonola line cord is plugged into the wall outlet. If the Symphonola line cord is pulled out of the wall outlet then all power is off and neither the Symphonola or Wired Remote Control System will operate.

SEQUENCE OF OPERATION.

With Schematic Wiring Diagram Fig. No. 2 before you, follow closely the following:

When a coin is dropped into the coin chute of a Wired Selector it passes through the slug rejector and just before it passes out of the slug rejector it momentarily closes contacts M5,

which are mounted on the slug rejector, and current flows from the power transformer (Green Wire) over cable conductor No. 21, through the winding of Locking Relay M3 and back over cable conductor No. 22, to the opposite side of the power transformer (yellow wire). This actuates Locking Relay M3 and closes contacts "A" which are locked in the closed position by armature "B" of Release Relay M4. This closes the circuit through the winding ing of Release Relay M4 to the common side of Selector Switches M1. Now a button (assume button No. 20) is depressed closing contacts No. 20. Current now flows through cable conductor No. 20 through Selector Solenoid No. 20 to the common ring. From the common ring it flows over conductor No. 25 of cable M19 down to auxilliary relay M6, through its winding and back to the green wire of the power transformer. This completes the flow of current through the three relay coils and the relays operate simultaneously. Now observe what happens as each relay operates. When Selector Solenoid M20 operates it raises a selector pin which stops the selector helix and causes the Symphonola to select the proper record. When auxilliary magazine relay M6 operates it closes contacts "C", which are in parallel with coin switch contacts "A", "B", "C", "D" and "E" of Fig. 1 through conductors No. 21 and 22 of cable M19. This operates the Symphonola Magazine Relay which registers a credit and starts the Symphonola mechanism. When Release Relay M4 operates its armature "B" releases contacts "A" of Locking Relay M3, which opens the circuit preventing the making of another selection until another coin is deposited.

For each succeeding selection the foregoing sequence is repeated.

From the foregoing it will be seen that for each coin dropped in the Wired Selector a selection must be made. In other words, you cannot drop in five coins and then make five selections, you must drop in a coin and make a selection, then drop another coin and then make another selection and so on until all desired selections are made. After the foregoing selection cycle has been completed Cancel Electro Magnet M2, Fig. 1, operates as the Symphonola mechanism closes contacts M15. When Cancel Electro Magnet M2 operates its armature "E" pushes the selector stop pin (Item 10, Fig. 6) down to its original position which clears this selection and allows the selector helix to continue around making other selections.

INSTALLATION

It is assumed that the Symphonola has been equipped at the factory for Wired Remote Control. Instructions for installing the Wired Remote Control equipment in a Symphonola already in the field will be covered in a supplement to this manual.

No definite rule can be laid down for the installation of a Symphonola with Wired Remote Control because every installation will present a different problem with peculiarities of its own.

Figure 3 shows two methods of running the cable from the Wired Selectors to the Symphonola. One or the other of these methods or possibly a combination of the two should be applicable to most installations unless of a very special nature.

In general it does not make any difference how the cabling is done as long as it is protected from mechanical injury, and that the distance from the Symphonola to the wired selector, that is the greatest distance from it, does not exceed 200 feet, and that not more than 12 wired selectors are supplied with power through any one cable.

The Wired Remote Control Power Supply is designed to furnish power to 12 Wired Selectors. Should more than 12 be required an auxilliary power transformer should be used and may be ordered from J. P. Seeburg Corporation under Part No. 11211. This transformer comes ready wired and equipped with a 4-prong plug that fits into a 4-prong socket (Item 11, Fig. 5) on the power supply. This automatically connects the auxilliary power transformer in the circuit. The only other requirement is to fasten the auxilliary transformer to the floor of the Symphonola cabinet with four

No. 8 round head wood screws 5/8 inches long.

(A) WIRED SELECTOR.

After the location of the Symphonola and Wired Selectors has been decided upon, the case of the Wired Selector should be removed. This can be done by inserting a key in the lock (Item 11, Fig. 8) and turning it counter clock-wise until it disengages with the lock stud. The housing can then be lifted off which exposes the entire assembly.

The Wired Selector Housing (Fig. 8) has as part of its assembly the program holder (Item 2, Fig. 8), which holds the 20 Selection title strips. The program holder is easily removed from the housing by grasping it on each side near the bottom and lifting up. The program retainer spring (Item 8, Fig. 8) will spring back and allow the program holder to be drawn from the program retainer strap (Item 7, Fig. 8). In replacing the program holder the top edge is first inserted under program retainer straps (Item 7, Fig. 8) as far as it will go. The lower edge is then pushed straight down until it snaps into place, past the extruded edge of program retainer springs which hold it securely in place.

Four holes are provided in the back plate for mounting the Wired Selector (see Fig. 3). These holes accommodate a size 10 screw. If the Wired Selector is mounted on a wood wall or post, one inch size No. 10 round head wood screws are recommended. If the Selectors are mounted on Tile, brick or plaster wall a toggle or expansion bolt may be used, or in some cases it may be necessary to provide a wood backboard which is first fastened to the masonry wall and the Selector then screwed to this board. In

any event, the size of the mounting bolt or screw should be equivalent to a size No. 10.

In mounting the Wired Selectors care must be taken to see that the unit is level horizontally and plumb vertically. If this is not done, the operation of the 5¢ slug-rejector will be affected and it will not properly select or reject coins.

After the mechanical work of mounting the Wired Selectors in their respective locations is completed, the cabling can be started. Use interconnecting cable, Seeburg Part No. 11204, which can be purchased in lengths to meet your requirements.

At the Symphonola a cable plug, Seeburg Part No. 11203, is attached to the end of the cable. The conductors are connected to the plug in the same order as is given for connecting to the Wired Selector. In attaching the plug to the cable be sure that the clamp is pulled up tight so that no strain is thrown on the conductors.

(B) CABLING.

To connect the cable to the Wired Selector terminal strip (Item 24, Fig. 4), remove the cable clamp or clamps at the lower edge of the back plate and lay cable in the notch, then replace the cable clamp and tighten it down. The cable can now be cut off and it should be cut 16 inches from the top side of the cable clamp. This will give plenty of wire length for connecting the individual conductors. Now with a sharp knife remove the outer braid and the paper serving from the cable, then bend the exposed conductors at right angles to the back plate (or directly toward you), then bend the cable so that it runs across the terminal

(Item 24, Fig. 4) strip just below the bottom row of terminals. A neater job will result if you will take a piece of strong twine and starting at the cable clamp put a series of half hitches about 3/4 inch apart up to the point where the conductors leave the form, then put a half hitch between each conductor as you proceed down the terminal strip.

The interconnecting cable (Part No. 11204) has 25 conductors and each conductor has a color, making it unnecessary to do any testing in order to get the conductors in their proper places. The sequence in which the conductors are connected to the terminals is given in the following table and this sequence holds true for all Wired Selectors and Cable Plugs or Terminal Strips in the Wired Remote Control System and the sequence should never be broken or changed.

Conductor No.	Color	Connect To Terminal No.
1	Blue	1
2	Orange	2
3	Green	3
4	Brown	4
5	Slate	5
6	Blue White	6
7	Blue Orange	7
8	Blue Green	8
9	Blue Brown	9
10	Blue Slate	10
11	Orange White	11

Conductor No.	Color	Connect To Terminal No.
12	Orange Green	12
13	Orange Brown	13
14	Orange Slate	14
15	Green White	15
16	Green Brown	16
17	Green Slate	17
18	Brown White	18
19	Brown Slate	19
20	Slate White	20
21	Blue Red	21
22	Orange Red	22
23	Green Red	23
24	Brown Red	24
25	Slate Red	25

It the above table is carefully followed, there will be no errors due to incorrect wiring.

If you have two cables in each Wired Selector, as in the case of cabling method No. 1 of Fig. 3, you will, of course, have two conductors of the same color for each terminal of the terminal strip.

When connecting the cable conductors to their respective terminals do not remove too much insulation as too much bare wire may result in short circuits between terminals and incorrect selections will result.

(C) EXTRA SPEAKERS.

Provision is made to supply the power for extra speakers through the interconnecting cable, conductors No. 24 and 25 are reserved for this purpose. Refer to Fig. No. 1, which shows the connections from the amplifier to the terminal strip on the side of Power Supply, (Item 2, Fig. 5). This connection is made by using a regular extra Speaker extension plug and cord which can be cut from the cord supplied with the extra Speaker, about 50 inches of this cord will be needed. This puts the power into the cable and it will appear on terminals 24 and 25 of the Wired Selectors (Fig. No. 1). The extra Speaker can then be connected to terminals 24 and 25 of the nearest Wired Selector.

In no case can more than two extra Speakers be used on a single system of Wired Remote Control.

MAINTENANCE AND SERVICE

Servicing the Wired Remote Control is simple in as much as there are so few parts which can give trouble and unless due to carelessness with resultant mechanical injury there is little to do to the system except to keep the relays free from dust and dirt and an occasional cleaning of the relay contacts as outlined under "ADJUSTMENTS".

Failure to operate can readily be traced down as either no power, or a blown fuse (M10, Fig. 1) will likely be the cause of most failures. No power, power is off. Blown fuse on circuit which feeds Symphonola or Symphonola line cord has been pulled out of the wall receptacle.

If examination reveals a blown fuse (M10, Fig. 1) and upon replacing this fuse the new fuse blows immediately it indicates an overload due to short circuited conductors. This condition must be corrected so that the system will operate with the proper size fuse, which is 3 ampere. Under no condition should a fuse of higher rating be used as it will most likely damage the power transformer.

(A) SYMPHONOLA IS ON BUT WIRED REMOTE CONTROL DOES NOT MAKE SELECTIONS:

Again check fuse M10, Fig. 2, if found to be good then check the contacts of locking relay M3, Fig. 2 to see that they are making contact. If these contacts are found to be in good condition and making contact the trouble is then an open circuit. Try different Selector button numbers and if other buttons make selections it is an indication that the trouble is in the individ-

ual circuit, and by checking from point to point with a voltmeter the circuit can be traced until the meter shows no reading, which indicates the trouble is between the last point checked and the point where no voltage is present. In order to check the circuit completely it will be necessary to have someone hold down the button corresponding to the circuit under test, or use a jumper across the contacts of Selector switch M1, Fig. 2, so that current will flow through the switch and out on its corresponding cable conductor.

(B) SELECTION IS MADE BUT SYMPHONOLA DOES NOT START:

Trouble of this nature is traceable to either the contacts "C" of the auxilliary magazine relay M6, Fig. 2 or in the Symphonola Magazine relay circuit, which can be quickly determined by dropping a coin in the Symphonola coin slot or by operating the Symphonola coin tripper manually. If the Symphonola starts under the above condition then the trouble is definitely in the contacts of auxilliary magazine relay (M6, Fig. 2) and their connections. If inspection shows all connections to be in good condition, examine the relay contacts closely for dirty or pitted contacts or for failure to close when auxilliary magazine relay M6, Fig. 2 operates. The contacts should be cleaned and adjusted as outlined under "ADJUSTMENTS". A hole is provided in the side of power supply subpanel and is closed with a plug (Item 5, Fig. 5) which can easily be removed for inspection of the contacts.

(C) COIN IS DROPPED IN WIRED SELECTOR BUT NO SELECTION CAN BE MADE:

This condition indicates trouble in the coin switch (Item 9, Fig. 4) which is mounted on the back side of the slug rejector assembly (Item 7, Fig. 4). If this switch does not make contact, locking relay (Item 13, Fig. 4) will not close contacts "A" (Fig. 2) which prevents a selection being made. Inspection and adjustment of contacts (M5, Fig. 2) will usually correct trouble of this nature.

(D) ILLUMINATING LIGHTS IN WIRED SELECTOR DO NOT LIGHT:

Power to Symphonola not turned on, light switch (M22, Fig. 2) is in the "Off" position or illuminating light bulb (M17, Fig. 2) burned out.

It is unlikely that all illuminating lights (Item 25, Fig. 4) in all wired selectors will burn out at one time, except in very remote cases of exceedingly high line voltage. However, if all Wired Selectors in a System fail to light it indicates an open in the lighting circuit of the system. Check carefully conductors and connections (Nos. 22 and 23) of cable (M20, Fig. 2) making sure that other parts of the system is operating properly.

If one or two of the Wired Selectors fail to light while others of the same system light, the trouble lies within the Wired Selector or Selectors that fail to light and is directly traceable to a burned out bulb (M17, Fig. 2) (Item 25, Fig. 4). Examination of Schematic Wiring Diagram (Fig. 2) shows the four illuminating bulbs (M17) wired in series, which means that if any

one bulb burns out or is removed from its socket the other bulbs will not light until the defective bulb has been replaced.

To locate the defective bulb, replace the bulbs one at a time with a bulb known to be good until all bulbs light. In some instances visual inspection will reveal the defective bulb as they at times turn dark when the filament burns out and a bulb whose glass has turned very dark can be looked upon with suspicion. The bulbs (No. 17, Fig. 2) (Item 25, Fig. 4) used in the Wired Selectors are standard Mazda type 44 with bayonet base, and all defective bulbs must be replaced with this bulb, otherwise the proper illumination will not be obtained.

(E) WIRED SOLENOID DRUM:

The Wired Solenoid Drum Assembly (Fig. 6) is a selector mechanism mounted on the rear of the Symphonola chassis directly below the rear vertical helix (Item 33, Fig. 6) by means of a flexible non-binding coupling. The Wired Solenoid Drum also contains the 20 selector solenoids (Item 6, Fig. 6) and cancel Electro Magnet (Item 16, Fig. 6).

The Wired Solenoid Drum is connected to the Wired Selectors by means of Cables (M19 and M20, Fig. 2).

When any one of the Wired Selector buttons is depressed it closes the circuit to its corresponding solenoid and current then flows through the solenoid winding which in turn attracts and raises solenoid plunger (Item 7, Fig. 6), which in turn pushes selector stop pin (Item 10, Fig. 6) up against selector disc (Item 3, Fig. 6). The rotating selector disc (Item 3, Fig. 6) has a stop (Item 15, Fig. 6) that will engage with any selector

stop pin (Item 10, Fig. 6) that happens to be pushed up. For example, if stop pin No. 9 is pushed up the selector disc (Item 3, Fig. 6) will rotate until its stop (Fig. 6, Item 15) engages pin No. 9. This will stop the rear vertical helix (Item 33, Fig. 6) in exactly the same position as if Selector lever No. 9 on front of the Symphonola cabinet had been pushed down manually. This action in turn causes No. 9 to be selected.

Immediately after the selection has been made the Symphonola mechanism closes cancel switch (M15, Fig. 1) also shown as (Item 24 in Fig. 6), which in turn energizes cancel electro magnet (Item 16, Fig. 6), which pulls down its armature. This pushes selector pin reset shaft (Item 18, Fig. 6) down on selector pin No. 9 (Item 10, Fig. 6) and it returns the selector pin to its original non-operated position.

Cancel electro magnet (M2, Fig. 1) receives its operating current through a 60-watt lamp (M17, Fig. 1) and contacts (M15, Fig. 1). Should cancel elector magnet (M2, Fig. 1) fail to operate, check the 60-watt lamp (M17, Fig. 1) to make sure that it is not burned out or loose in its socket. Also check contacts (M15, Fig. 1) and see that they make contact each time the Symphonola operates, also see that these contacts are clean and not pitted.

(F) SLUG REJECTOR:

The Slug Rejector used in the Wired Remote Control System is National Slug Rejector Standard S type, for nickles only. Instructions covering service and adjustment of these units is covered in a bulletin entitled "Nickle Slug Rejection by National", and may be obtained from the J. P. Seeburg Corporation, Service Department.

ADJUSTMENTS

There are comparatively few adjustments to be made in the entire Wired Remote Control System. The relays and their contacts are the only parts of the system that will require attention.

For correct adjustment and care of the contacts you should have a set of contact adjustment tools shown in Figure 7. The gram scale "A" is used to determine the amount of pull required to move the armature of a relay. When a value of grams is given for a particular relay, the gram scale is used to set other like relays to the same value. This adjustment is made by adjusting the tension of the armature reactile or tail spring until the specified pressure in grams just moves the armature away from its back stop, with the tongue of the gram scale at a specified point. This point is usually at the extreme end of the armature.

The contact burnisher "B" is used to clean and polish the relay contacts. This is done by drawing the burnisher back and forth between the contacts while at the same time a small amount of pressure is applied to the armature in order to hold the contacts firmly against the burnisher.

The contact spring bender "C" is used to bend the contact springs so that their contacts are the correct distance apart.

The relays in the Wired Remote Control System are designed and factory adjusted to operate with a specified amount of current flowing through their winding. The adjustment, however, is the same as with the Gram scale. For both methods, the adjustment is made with the tail or reactile spring tension. For adjustment in the field the Gram Scale is the most convenient and practical.

CAUTION: When cleaning contacts or adjusting Relays be sure that all power has been turned off. This precaution will not only save you from unpleasant shocks, but will prevent damage to the Relay Contacts through short circuit.

(A) ADJUSTING THE AUXILLIARY MAGAZINE RELAY:

The Auxilliary Magazine Relay (Fig. 6, Item 7) is adjusted as follows: when Armature "D" (Fig. 6) is pulled in, moving contact "C" (Fig. 6) strikes stationary contacts "B" and when held in this position, moving Contact "C" should clear the bakelite Armature insulator 1/32 of an inch. This may be adjusted by loosening screws "G" and sliding stationary Contact "B" in or out to get the proper distance at "D".

With the Relay in the relaxed or non operated position, the stationary Contact "B" and moving Contact "C" should stand open 1/16 inch. This clearance can be adjusted by again loosening screws "G" and moving Armature back stop "A" in or out until the proper clearance is obtained.

After the Contacts are adjusted and the screws tightened, the Armature tension is adjusted. Place the tongue of the Gram scale on the moving Contact "B" at the point indicated by arrow "B" and slowly apply pressure to the Contact until the armature leaves the Back Stop "A". The pressure required to do this should be between 35 and 40 Grams. If more or less pressure than specified is required, it is corrected by bending armature Reactile Spring Support "F" which controls the tension of Armature Reactile Spring "E". This completes the adjustment of Auxilliary Magazine Relay (Fig. 6, Item 7).

(B) INTERLOCKING RELAY ASSEMBLY:

Interlocking Relay Assembly (Fig. 4, Item 11) consists of Locking Relay (Item 13) and Release Relay (Item 14) and a mounting plate shown as Item 11. The adjustment of these Relays are much the same as outlined for the Auxilliary Magazine Relay.

(C) RELEASE RELAY:

Release Relay (Fig. 4, Item 14) is adjusted first by pushing its Armature "H" down as far as it will go and then adjusting stop "G" by bending until there is 1/16 inch clearance between the extreme end of Stop "G" and Armature "H" with the tongue of the gram scale applied to Armature "H" at point indicated by arrow "H". Adjust tension of Armature Reactile Spring "I" by bending Reactile Spring Support "J" until Armature "H" just leaves Stop "G", when a pressure of 10 to 15 grams is applied with gram scale applied to Armature just above point indicated by arrow "H". While making this adjustment be sure that Armature "A" is held away from Armature "H". If this is not done a correct gram value will not be obtained due to friction between Armature "A" and Armature "H".

(D) LOCKING RELAY:

The Locking Relay (Fig. 4, Item 12) is adjusted next. With Locking Relay (Item 13) in its operated position, its Armature Stop "B" is adjusted until there is a clearance of 3/32 inch between the extreme end of Stop "B" and Armature "A". Now hold or block Armature "H" so that it does not touch the latch plate "X" of Armature "A" and apply tongue of Gram Scale to point indicated by arrow "X", adjust tension of Reactile Spring "F" by bending Reactile Spring Support "E" until a pressure of 45 to 50 Grams

just moves Armature "A" away from Stop "B". With Locking Relay (Fig. 4, Item 13) in its non-operated position adjust Stationary Contact Spring (by bending with Tool "C" (Fig. 7) until there is a clearance of 1/32 inch between Contact "C" and Contact "D".

Contacts "C" and "D" should be checked further by slowly moving Armature "A" in towards its operated position while at the same time observing the movement of Contact "C". This Contact should move about 1/16 inch while in Contact with Contact "D". In other words, the Armature is pushed in until Contacts "C" and "D" just touch them by pushing the Armature in until it stops, Contact "C" should move about 1/16 inch from its normal non-operated position. This is known as follow through of a Relay Contact Spring and is a means of causing the Contacts to remain in contact longer. The foregoing paragraph is just a check and if all other adjustments have been correctly made, then the follow through of Contact "C" will automatically be taken care of.

With Locking Relay (Item 13) in its operated position and Release Relay (Item 14) in its non-operated position, the bottom edge of Armature "H" should be 1/16 inch past the lower edge of latch plate "X" of Armature "A". This distance can be adjusted by loosening the mounting screw of Locking Relay (Item 13) and moving the entire Locking Relay assembly up or down until the correct distance is obtained. After which the mounting screw is tightened and the relay locked in place.

(E) SELECTOR SOLENOID:

No adjustments are required for the Selector Solenoid (Fig.

6, Item 6) except to see that Solenoid Plunger (Fig. 6, Item 7) and Selector Stop Pin (Fig. 6, Item 10) move freely without binding.

(F) CANCEL ELECTRO MAGNET:

Cancel Electro Magnet (Fig. 6, Item 16) requires adjustments as follows: With Armature "A" in its operated position adjust Armature stop "B" by bending until there is 1/8 inch clearance between it's extreme end and Armature "A", with tongue of gram scale applied to Armature "A" at point indicated by arrow "A", adjust tension of armature Reactile Spring "C", by bending Reactile Spring Support "D", until a pressure of 35 to 40 grams causes Armature "A" to just leave Armature Stop "B".

This completes the adjustment of the Wired Solenoid Drum assembly, except of course that all moving parts be inspected to assure freedom of movement and that no binding exists.