Complete Instructions for

Keeney's

SUPER BELL

Single Coin Combination Check and Replay Model

MFD. BY J.H. KEENENY & CO. CHICAGO, U.S.A.
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SETTING UP

1 - Place game in desired location.

2 - Open top, remove back door and run service cord through slots at bottom right side of back door.

3 - Cabinet must stand level for proper operation of coin ejectors.

4 - Plug into a 110 volt 50-60 cycle A.C. service outlet. Many complaints of improper operation arise from this source. Be sure the plug-in connection is tight.

5 - Weights may be placed in the bottom compartment if so desired.

6 - DO NOT PLUG INTO D. C. WITHOUT PROPER CONVERTER EQUIPMENT; See Heading D. C. Operation.

CHECKING FOR PROPER OPERATION & ADJUSTMENT

7 - See inside of back cover of this manual.

REPLAY OPERATION

8 - Move adjustment plug on lower panel to replay side of socket. Connect spring on free game unit as shown on instruction card along side of the same so that it will release one game at a time.

9 - Attach a wire between bottom of hinged portion of check separator and tin trough so that hinged portion leaves a 1/8" open slot at bottom of check separator. See Fig. 3.

10 - Remove payout tube, if desired, and close up opening in trough with tape.

11 - Lock payout drawer.

12 - Advise the merchant of the method of redeeming free plays. The player is entitled to one coin for each number shown on the backboard.

13 - At the time of redemption the free play reset button on the right side of the cabinet should be pushed to reset the unit and register the redeemed replays on the meter.

14 - Redeemed replays are registered on the meter which is located in the cash drawer.

CASH OPERATION

15 - Plug on lower mechanism panel should be on cash side of socket.

16 - Spring on free game unit should be connected as shown on instruction card along side of same to reset unit to zero position with each play.

17 - Install payout tube. Do not make screw holding payout tube too tight or the same will be distorted causing the coins to jam.

18 - Check separator should be closed at the bottom and adjusted so that coins go through to the payout tube. See FIG. 3.

19 - Load payout tube with coins dropping them in one at a time.

20 - The fastest way to properly fill the payout tube is to have the top of the machine up, hold the armature of the coin chute coil in by hand and drop the money through the coin chute opening. This will insure the coins dropping into the tube properly and not piled up sideways to cause a jam.

OVER-SIZE CHECK OPERATION

21 - Game should be set up as for cash operation outlined above.

22 - Oversize German-silver checks must be used.
OVER-SIZE CHECK OPERATION - Continued

23 - Check separator is the slanted assembly immediately below the coin chute. The gauger strip which is held by two screws should be raised by loosening the screws to such a point that 5¢ size coins drop out the side of the unit allowing the over-size checks to go into the tube. See FIG. 3.

NOTE:—Where absolutely necessary slug rejectors can be furnished which will accept over-sized brass checks. With this adjustment, however, there is a tendency to pick up a greater quantity of slugs and also good coins will be rejected quite frequently.

MINT VENDOR

24 - Mint Vendor is located in right side wall of game.

IMPORTANT:

DO NOT USE CRACKED OR BROKEN MINT PACKAGES!
DO NOT USE ODD OR MIXED SIZED MINT ROLLS!

25 - To load: — Pull drawer out far enough to clear loading end of mint retainer strips. Slip spring tensioners out of grooves. Load each row with mints up to WITHIN ONE MINT OF END OF RETAINER STRIPS. Put spring tensioners over last mint rolls.

26 - NOTE: — Spring Tensioners should not be too tight. About three turns is sufficient to bring the last mint down.

27 - IMPORTANT:—Roll over switch in right hand mint row is to prevent machine operation when the vendor is empty. It should positively close when mints are on it or coin chute will not accept coins.

28 -

ALSO - A contact is closed by the back of the drawer to cut 110 volt circuit to mechanism when drawer is out.

29 - Keys to mint vendor and a supply of mints may be left with the merchant.

WINNING ROW FREQUENCY

30 - Winning row frequency may be changed by means of the plug and socket in the cash drawer to the left of the cash box. See FIG. 2. Plug in uppermost position so that all eight sockets are filled will light maximum number of winning rows. The next position down, leaving two blank sockets, is medium, and the third position down, leaving four blank sockets, is conservative.

31 - On games, serial numbers 1301 and over, a 4th extra conservative position is provided with the plug in the last two sockets leaving six blank ones between the plug and bar.

TO EMPTY PAYOUT TUBE

32 - Set up a high winner manually on reels. Hold spinner motor fan and start game. When payout occurs, release spinner motor fan and hold sequence motor fan to prevent restarting. When payout is over close cam 46 to reset commutator, repeat until tube is empty, then release sequence motor fan.

OR

Operate Payout Slide Manually.

FUSES

33 - The 110 volt input fuse is a 5 ampere cartridge fuse.

34 - The lights (white wire) are on a 10 ampere cartridge fuse.

35 - The controls (red wire) are on a 15 ampere cartridge fuse.
FUSES - Continued

IMPORTANT!

36 - A special fuse of 3 ampere size is mounted alongside of the spinner unit. Its purpose is to prevent the small wiper blades in the spinner unit from being burned up should a short circuit occur anywhere ahead of the spinner assembly; that is, to the payout or 3 bar relays.

NEVER replace with any other size.

LITE BULBS

37 - Light bulbs in the light box and at the coin chute are #55 automotive and can be purchased from any garage or automotive supply house.

38 - "Winning row" light bulbs are special 27-volt type made especially for this company and should not be replaced with any other type. These bulbs are J. H. Keeney & Company's No. 27, list price 10c each.

LUBRICATION

39 - Every three months or $2500.00 of play, all motor bearings should be lubricated as described on the label on each motor.

40 - At the same time the three reel bearings and two reel shaft bearings should be lubricated with medium motor oil. Do this by using a wire as a dropper applying not more than three drops of oil to each oil hole of which there is one on each bearing. The contact plates throughout the mechanism are very thinly coated with lubricant at the factory. In most cases this lubricant will become dirty or gummy after about six months' use, causing bad contacts. The plates should then be cleaned with carbon tetrachloride on a brush and recoated with an extremely thin application of white vaseline.

IMPORTANT:- Over lubrication causes more trouble in coin operated equipment than under lubrication. Practically all contact trouble is caused by over lubricating the various parts so that specks of oil or grease and the oil vapor from parts which become heated are deposited on to the relay contacts, sequence contacts, etc., where they form a gummy residue which will not allow current to pass through.

DIRECT CURRENT OPERATION

41 - For safety reasons, all control parts of this machine are operated by low voltage A.C. requiring the use of a 300 watt rotary converter for D.C. operation.

42 - If the machine has been ordered from the factory AC-DC equipped, the converter will be bolted inside the bottom compartment.

43 - To operate on D.C. simply plug the line from the converter into the four way socket located to the right side of the relay bank.

44 - To operate on A.C. simply remove this plug and replace with the dummy short circuited plug furnished.

45 - The converter operates constantly so that current is available when a coin contacts the trip switch on the slug ejector.

46 - D.C. converters may be installed outside our factory by wiring the same to the plug, as shown on the wiring diagram.

47 - Input voltage to the converter should be suitable to the local line. Output must be 110 volts, 60 cycles A.C. Capacity must be 300 watts minimum.

25'- 30 CYCLE OPERATION

48 - Special motors and transformers can be furnished at extra cost.
TO REMOVE UPPER MECHANISM SHELF

49 - Pull the various plugs out CAREFULLY and STRAIGHT UP.

50 - Remove screws which hold shelf to side rails. Shelf can now be lifted up through the top of the cabinet.

IMPORTANT: Do not lift the mechanism by means of the threaded cross rods as if they become bent the contact plates will be thrown out of alignment with the wipers on the reels.

TO REMOVE LOWER MECHANISM SHELF

51 - Empty and remove payout tube. Payout tube is held at bottom by single screw.

52 - Pull out plugs very CAREFULLY and STRAIGHT UP.

53 - The shelf can now be pulled out the back.

EXTRA PLUGS AND SOCKETS

54 - At various points on the lower mechanism shelf are extra sockets and blank plugs. These sockets are used for extra attachments. FIG. 1 shows proper position of dummy plugs when extra attachments are not used.

55 - The skill attachment socket is used when the game is ordered with a skill field.

56 - The mint socket is used for operation of the mint vendor when so ordered.

OPERATION OF PARTS OF MACHINE

57 - When the game is plugged into a 110 volt service outlet, the coin chute light should come on and the coin chute lock coil in parallel with the light should pull in to allow coins to pass through to the trip switch.

58 - Notice that the coin chute lock will only allow coins to pass when the coil on it is energized.

59 - The coin chute lock is de-energized and will refuse coins under the following conditions:

A - When no current is coming to the machine.

B - When the coin chute relay is pulled in after dropping a coin, breaking the orange-black to orange-line by the break contacts on it.

C - In free game operation when the free game register gear is off the zero position, breaking the orange to blue-white contacts.

D - In mint vendor operation when the mint vendor is empty opening the blue-white to white-blue lines.

60 - The coin drop switch gets its current through the orange-black wire from #1 sequence cam, pulling in the coin chute relay.

61 - The coin chute relay locks itself closed by means of the pair of contacts on it, black-yellow to orange-black wires, staying closed in cash operation until the #1 sequence contact opens the orange-black line.
OPERATION OF PARTS OF MACHINE - Continued

62 - Also on the coin chute relay is a break contact, orange-black to orange wire to de-energize the coin chute lock coil, as explained in paragraph 38 above.

63 - On free game operation with replays on the register, the coin chute relay is automatically pulled in immediately when sequence cam #1 closes by the three blades on the free play unit which close as long as the free game unit is off of the zero position.

64 - When the coin chute relay is locked down current is now furnished to the start switch through the orange-blue wire. When the start handle switch is closed current flows through the red-blue wire to the run relay which locks itself down by the contacts on it connected to the orange-blue and red-blue wires, i.e., across the start switch, thereby holding the run relay down until the coin chute relay releases.

65 - The run relay when pulled down immediately starts the sequence motor by furnishing current from the red wire to the blue-red-white wire across the #2 sequence cam contacts. It will be noticed that #2 sequence cam contacts are open in the start position of the game so that when the current to the run relay is cut off after the game starts, current to operate the sequence motor is furnished by #2 cam contact.

66 - The blue-red-white wire from #2 cam goes to both cam #4 and one of the contacts on the mixer commutator. Sequence switch #4 opens momentarily just after starting, stopping the sequence motor. As soon as the motor mixer turns to a position to close the contact on it carrying blue-red-white to red-yellow wires, the sequence motor again starts up and when sequence #4 closes again the motor is operating free of the mixer commutator. SEE FIG. 9.

67 - Blue-red-white wire from #2 cam also goes to #3 and #5 cams which controls the spinner motor. These cam switches close immediately after the game starts.

68 - The winning row selector release coil (FIG. 6) is connected in parallel with the spinner motor allowing the selector disc on the end of the spinner shaft to rotate until current to the spinner motor is cut off, when cam #3 opens.

69 - Inasmuch as the sequence motor has been stopped for an indefinite period during the play, the spinner motor operates for longer or shorter intervals depending on the period of time in which the #4 cam is open at which time sequence motor current is furnished from the mixer commutator contacts.

70 - The mixer commutator motor (FIG. 9) is energized during the spin by means of the pair of contact blades mounted on the winning row release coil connecting red to blue-yellow wires.

71 - The pair of contacts (FIG. 9) on the mixer motor with blue-red-white and red-yellow wires control the length of the time which the sequence motor is stopped.

72 - The mixer commutator motor contacts (FIG. 9) carrying load to blue-yellow wires are follow through contacts to prevent the mixer motor from stopping with one of the other contact blades closed.

73 - Immediately after the sequence motor starts, cam #6 closes to reset the payout commutator and step back the free-game register through the gray-red wire.

74 - Also immediately after the sequence motor starts, cam #7 closes to pull in the anti-tilt and lock in relay through the white-gray wire. This relay prevents cheating the machine by pulling out the plug or tilting the game. It locks itself down through the contact on it, white-gray to red wires, and will stay locked down at all times unless the game is tilted or the service plug pulled out.

75 - The white-gray line furnishing lock-in current to the anti-tilt relay goes first through a break contact on the tilter relay coming out blue to the lock in coil.
OPERATION OF PARTS OF MACHINE - Continued

76 - The tilter relay which when pulled in, opens the anti-tilt relay, is connected to the plumb-bob tilt through the white-brown wire, and also to the free game reset button.

77 - Immediately after the sequence motor starts, the time clock is wound up to turn on the Winning Row Lights.

78 - After #3 and #5 sequence cams open the circuit to the spinner motor, the reels are free to coast until the three stops come in. #5 cam controls the "cutoff" of the Spinner Motor. To assist in slowing down the reels there is an adjustable brake spring for each. These springs serve to brake the reels down to such a slow speed that when the stops drop in the reels they will not bounce back.

79 - Immediately after #3 reel stops, (SEE FIGS. 7 & 8) sequence cam contacts #8 and #9 close to perform payout functions, if any, as follows.

80 - The reels have three complete and separate sets of payout circuits through them to handle the top, center, and bottom row winners. Each of these sections is energized from the winning row selector assembly which receives its current through the special 3 ampere fuse.

81 - The payout and winner light circuit for the top row is the orange-brown wire and the bottom row is on the blue-brown wire.

82 - The center row is red-black wire (direct to 25 volts).

83 - Payout outputs from the sections go to corresponding wipers on the payout commutator, coming out from the commutator to the green-red wire to the payout relay.

84 - The back side of the payout relay coil comes out through the black-gray wire, goes through a pair of contacts on the anti-tilt relay coming out black-white wire to go to cam #8.

85 - Cam #8 closes after #3 reel comes to rest, allowing the payout relay to be pulled in if current is coming from the payout commutator.

86 - Going through the anti-tilt relay in this manner prevents the payout relay from pulling in if the game has been tilted or the service plug pulled out.

87 - Each of the bar winners in positions A, B, and C has its own "bar relay." The function of the bar relay is to close the payout circuits of the oranges, plums, etc., through to the commutator directly from #2 reel when two of these symbols plus a bar appear.

88 - The back side of the bar relays are common to the black-green wire and are controlled by sequence cam #9 which operates at the same time that payout cam #8 closes.

89 - When the payout relay is pulled in the following functions are performed by it.

A - The break contact on it, red-yellow to red-black-white wires opens to stop the sequence motor.

B - The red-yellow to blue-brown contact closes to start the mixer commutator motor. This special circuit leaves the payout relay as blue-brown, going to the skill attachment socket and coming out blue-yellow to the mixer commutator motor.

C - The other contacts on the payout relay receives impulsive current through the black-green-red wire from one of the sets of the contacts on the mixer commutator motor sending it through the orange-green-red wire to the payout commutator step-up coil and the free game register step-up coil.

D - The orange-green-red-wire also leads to the free play -- cash changeover socket so that on cash operation the current is also sent through the brown-yellow-red wire to the payout slide solenoid.
OPERATION OF PARTS OF MACHINE - Concluded

90 - Thus, as long as the payout relay is held down by current coming from the commutator, one set of contacts on it will keep the sequence motor stopped and will energize the mixer commutator motor. The other payout relay contacts will furnish the current through one of the mixer commutator motor contacts to operate step-up coils, etc.

91 - On completion of the payout, the payout relay releases allowing the sequence motor to restart bringing the game to initial position.

92 - As soon as the sequence shaft goes to the initial position cam #1 closes pulling in the coin chute lock coil allowing the game to be played again.

SPECIAL FUNCTIONS ON FREE PLAY OPERATION

93 - On the free game register unit is a three bladed contact assembly which closes together when the register is off of the zero position.

94 - The black-green wire furnishes current to the other two contacts, obtaining the same from the #1 sequence contact.

95 - The contact with black-yellow wire attached pulls in the coin chute relay so that coins are not required to play the game.

96 - The brown-white wire furnishes current to the free play lines and to the merchant's reset push button.

97 - When free replays are showing and the merchant's reset push button is pushed, the replay reset push button coil is pulled in through the green-black wire to perform the following functions:

A - The brown-white to blue-yellow contacts start the mixer commutator motor.

B - The contacts with white-gray to white-brown wires pull in the tilter relay to show "tilt".

C - The two contacts being supplied by the black-green wire receive current through this wire from one pair of contacts on the mixer commutator motor assembly. This impelled black-green wire goes through one of the contacts to the gray-black line to the redeemed replays meter.

D - The other contact furnishes current through the gray-red wire to the free game register set back coil.

98 - Thus, the replay reset push button coil is mechanically latched in when the push button is depressed. The mixer and commutator motor will continue to run until the free game register reaches zero position, opening the three blade contact assembly.

99 - When the free game unit reaches zero position the pair of contacts on it with orange to blue-white wires close, operating the replay reset release coil and unlatching this assembly.

MINT ATTACHMENT OPERATION

100 - When the mint attachment is used the main difference in operation in the machine is that the coin drop switch is disconnected from the starter relay and is connected directly to the mint release coil.

101 - The mint release coil on pulling in closes a contact at the end of the drive stroke, which contact pulls in the coin chute relay.

102 - There is a roll-over type of contact mounted in one of the mint compartments which opens when the compartment is empty, opening the circuit to the coin chute lock and preventing coins from being deposited.

103 - There is also a contact in back of the drawer which "cuts" all 110 volts into the machine when the drawer is pulled out.
Fig. 3
CHECK SEPARATOR ADJUSTMENT

For Check Operation—Raise front piece so coins fall out of front slot, retaining oversized checks. IMPORTANT! Be sure slot is same width for coins thru entire length.

FREE REPLAY ADJUSTMENT
Open front piece to 1/8 inch opening along bottom, hold open with a wire between front piece and coin runoff trough. Do not open too far or coins will "hang" on top edge.

Fig. 4
COIN SWITCH ADJUSTMENT

Contacts should be spaced 1/2 inch apart when open. Contact tension must be light enough so that a coin released slowly as shown will not "hang up."

Guides must drop into center of check separator when hinged side of separator is held open as shown.
**Fig. 5**

**Motor and Brake View of Spinner Mechanism**

**OVERALL REEL BRAKING ADJUSTMENT.**
Loosen 4 outside nuts EXACTLY one turn. Bring inner nuts on rods up to re-tighten. If nuts at opposite end of threaded rod which hold metal reel housing are tight against supports, loosen until threaded rod is free. Re-adjust reel brakes and/or No. 5 Motor Cam to get correct "bounceless" spin.

**Fig. 6**

**Winning Row Selector End of Mechanism**

**Winning Row Selector Contacts.** MUST CLOSE when armature is pulled in to start mixer commutator motor.

- Winning Row Selector Release Coil
- Bar Relays
- Screws for adjusting position of release coil
Fig. 7
Showing position of No.9 Sequence Contact at instant of No.3 Reel Stop Finger Dropping in.

Motor can be brought to this position by carefully allowing fan to slip between fingers, then pulling service plug.

\( \frac{1}{4} \) inch between contact lifter and lobe of cam. To adjust for this position, loosen \( \frac{1}{4} \) of No. 3 Reel Stop Finger Cam (held by set screw) and turn to suit. (Re-adjust stopping of No.3 Reel to prevent "bounce".

Fig. 8
Showing correct stopping position of Sequence Motor during Pay Out

Motor must stop quickly enough so that this cam lobe is not over \( \frac{1}{4} \) way past cam switch lifter. Adjustment is made by carefully putting more tension on motor brake. Too much tension on brake will slow up game by requiring more than two starts during "mixing.

Washer between motor armature and frame must be free when motor is running or motor will not start on low voltage and excessive wear on washer will spoil brake action.
Fig. 9

Mixer Commutator Motor Assembly.

All contacts should have \( \frac{1}{32} \) inch gap when open

- Mixer Contact
- Payout and Free Replay Contact
- Follow Thru Switch

**IMPORTANT!**

Follow thru Switch and Brake Adjustment Motor must NEVER stop with payout contact closed.

Follow thru switch must be adjusted to run motor past closed payout contact position. Brake must stop motor between follow thru contacts, but must not be too tight or motor may fail on low voltage.
SKILL ATTACHMENT OPERATION

NOTE: Skill Attachment can only be installed at the factory on special order.

104 - The main difference in operation with the skill attachment is that in case of a payout, payout cannot start until a ball is placed in a skill lane closing the circuit to start the mixer commutator motor.

105 - Should a ball go into the two lane, the regular winner if shown on the reels will score; if there is no winning combination on the reels two points only are scored.

106 - Should a ball go into the out lane, even if a winner is shown on the three reels, the sequence motor is brought around to starting position without scoring.

SERVICE INFORMATION

(ALSO SEE INSIDE OF BACK COVER OF THIS MANUAL)

107 - An experienced service man will always look for a possible loose wire, bad connection at a plug and socket, loose coil in the mechanism, broken or unhooked springs on step-ups, relays, etc., before twisting or bending parts, or reconnecting wires.

108 - 75% of all troubles are caused by inexperienced tampering with parts!

109 - On any Keeney game, the red wire is always the 25-volt side of the transformer, the white is 6 volts, the black is common to all lites and coils (except on SUPER BELL, the Bar and payout relays, which have sequence contacts #8 & 9 interposed between the coils and the black line).

110 - This means that any coil can be checked by touching a jumper from the red line to the coil connection opposite the black.

111 - Loose connections or bad plugs and sockets can be found in this manner by touching a red jumper directly to the coil lead, then touching the same wire at various points going away from the coil.

112 - All contacts should be adjusted to 1/32" clearance when "open" - about the thickness of a very thin, worn dime.

113 - All contacts when "making" should touch each other and then "follow through" for another 1/32".

114 - Relays for the control circuit on the lower shelf are self-adjusting and self-cleaning and should require very little attention.

SHOULD MACHINE FAIL TO OPERATE PROPERLY
MACHINE COMPLETELY DEAD
NO COIN CHUTE LITES - WILL NOT ACCEPT COINS

115 - Check service outlet for current turned on.

116 - Check extension cord to machine for damage or cuts.

117 - Check service plugs for tight connection with outlet.

118 - Check 5 ampere 110 volt fuse.

119 - Check 15 ampere fuse on red line.
120 - Check all multiple plugs and sockets for clean, tight connection.

121 - Check contact in back of MINT VENDOR drawer which should close when drawer is in all the way. This contact breaks entire 110 volt input when drawer is open.

MACHINE O. K. EXCEPT LIGHT BOX & DISPLAY LIGHTS ARE DARK

122 - Check 10 ampere fuse on white line.

REFUSES COINS - WINNING ROW LIGHTS ON WHEN TIME CLOCK IS OPERATED

123 - Make sure difficulty is not in coin chute by operating coin trip switch by hand. If game operates in this manner, slug ejector is probably dirty, or cabinet is not standing level.

124 - Slug ejector can be cleaned by pouring carbon tetrachloride thru it and then running a thin brush thru the openings.

125 - Check armature on coin chute lock coil. When pulled in, the armature stud should allow good coins to come down into the trip switch opening.

126 - Make sure that cam switch #1 is closed to furnish current through orange-black wire to coin switch and coin lock coil. (Sequence motor might have stopped before completing revolution). See following paragraph "Sequence Motor Stopped."

127 - Check break contact on replay reset relay, black-yellow to black-blue wires which lead from coin switch to the coin chute relay. Replay reset relay should be unlatched and these contacts closed.

128 - Merchant’s replay reset assembly is unlatched to normal position by the pair of contacts on the free game register unit which closes in “O” position (orange to Blue-White wires).

129 - If Mint Vendor has been removed, be sure proper dummy plug is in Mint Vendor socket.

130 - Make sure dummy plugs in Mint Vendor and Skill Sockets have not been interchanged.

131 - MINT VENDOR OPERATION - Check mint drawer to make sure same is loaded with mints and also that roll-over contact in last mint position in right hand row is closed.

ACCEPTS COINS - REFUSES TO START

132 - Coin trip switch may not be making contact to pull in coin chute relay.

133 - Coin chute relay may be refusing to lock itself down, after being pulled down by coin trip switch. Check lock in contacts on coin chute relay – orange-black to black-yellow wires.

134 - If coin chute relay is locked down O.K., check contacts on same, red to green-yellow, which feed starter contacts.

135 - Starter handle contacts should pull in run relay which locks down by contacts on it, red-blue to green-yellow, with green-yellow receiving lock in current from red to green-yellow contact on starter relay.

136 - If run relay locks down O.K. check contacts on it, red to blue-red white which furnish starting current to motors while sequence cam #2 is open in starting position.

137 - Check sequence cam #2 for proper opening.

SEQUENCE MOTOR IS STOPPED DURING PLAY

138 - Check sequence cam contacts #2 and #4 for clean proper pressure.

139 - WITH REELS SPINNING - mixer commutator motor (FIG.9) may not be running, leaving mixer contacts open.

17
SEQUENCE MOTOR IS STOPPED DURING PLAY - Continued

A. Mixer motor may not be receiving current from contacts on winning row selector release coil (red to blue-yellow) SEE FIG. 6. Motor should run when these contacts are depressed.

B. Mixer motor may be defective - check by applying jumper from red wire to blue-yellow on motor. (Or Motor should run anytime armature of winning row selector coil is operated by hand)

140 - WITH REELS SPINNING - mixer commutator motor running - mixer contacts (FIG. 9) (blue-red-white to yellow wires) on mixer commutator are not closing when engaged by rivets on Bakelite disc.

141 - With sequence cam switches #8 and #9 closed - see "DOES NOT PAY OUT".

GAME PLAYS FREE WITHOUT USING HANDLE - SEQUENCE MOTOR REFUSES TO STOP

142 - Check sequence cams #1 and #2 for proper opening.

A. #1 cam releases starter relay immediately after game starts.

B. #2 cam shuts off sequence motor at end of play.

143 - Check contact on run relay (red to blue-red-white) for proper opening.

144 - With MINT VENDORS - Check contact on drive arm of mint vendor for proper opening.

If these contacts are too close, however, it may be possible to play the game free by manipulating the knob.

GAME PLAYS FREE BY DEPRESSING HANDLE

145 - Coin trip switch contact remaining closed, not opening after coin leaves same.

146 - Coin trip switch closed because of coins piling up in or against top of check separator.

147 - On FREE REPLAY OPERATION, 3 bladed contact on Free Game register not opening in "OFF" position.

148 - ON MINT VENDOR OPERATION - Mint release arm contacts too close together, may allow players to manipulate knob.

DOES NOT PAY OUT - WINNING ROW LIGHTS DARK

149 - Check 3 ampere fuse alongside of spinner unit.

IMPORTANT!

Never replace this 3 ampere fuse with anything of a higher rating. This fuse is for the purpose of protecting the wiper blades in the spinner unit against overloads. These blades will last indefinitely without overload but will burn out in a few revolutions if a short circuit is present.

If wiper blades are damaged, upper mechanism shelf must be returned to the factory for proper replacement of these parts.

150 - Check clock timer contacts.

DOES NOT PAY OUT ANY COMBINATION - WINNING ROW LIGHTS ON

151 - Check payout tube for coins turned edgewise or jammed.

152 - Check green-red payout commutator line to payout relay which should pull in when #8 cam is closed, providing black-gray to black-white contacts on anti-tilt relay are closed.

153 - If payout relay pulls in but mixer commutator motor does not start, check payout relay contacts red-yellow to blue-brown.
DOES NOT PAY OUT ANY COMBINATION-WINNING ROW LIGHTS ON - Continued

164 - Check mixer motor for starting, using a jumper to the red line, or depressing armature on Winning Row Selector Coll.

165 - If payout relay pulls in but sequence motor does not stop, to allow payout, check payout relay contacts red-yellow to red-black-white for proper break.

166 - If payout relay is pulled in and mixer commutator motor turns, check red to black-green-red impulse contacts on the mixer commutator assembly which feed through contacts on the payout relay to operate the payout commutator (SEE FIG. 9).

167 - Also check contact on payout relay black-green-red to orange-green-red, which sends impulses to commutator step-up as described above.

168 - If payout relay does not pull in, check 40 position "break" contacts on commutator.

169 - Check payout step-up commutator for proper operation. If commutator does not step up, due to a broken spring, etc., sequence motor will remain stopped with #8 and #9 cams closed, and mixer commutator motor will not stop.

ALL PAYOUTS O. K. EXCEPT WHEN BAR SHOWS

160 - If bars do not score on any rows check sequence cam #9 for proper closing at the same time as #8, to pull in the bar relays when a bar appears on Reel III.

161 - If difficulty is on one row only check contacts on the relay for that row.

DOES NOT PAY OFF CERTAIN COMBINATIONS AT ANY TIME

162 - Check wipers on the payout commutator. Also clean the commutator disc, if necessary, with carbon tetrachloride.

163 - Check alignment of stationary contact discs with wipers on the reels.

164 - Alignment of the discs with the wipers on the reels may be checked as follows -- Set reels on a large payout which is known to be operating. Hold spinner motor until payout starts then hold or tie sequence motor fan so that cams #8 and #9 are closed in payout position. Now, with the sequence motor tied in payout position turn the reels manually to one of the combinations which does not pay out correctly. Reset the payout commutator by closing #6 sequence cam. If the combination does not pay out, pull back the reel stop fingers one at a time and as each stop finger is pulled out move the corresponding reel back and forth about one-quarter position each way. If the reel wipers are in proper alignment it will be possible to obtain the payout with any of the reels as much as 1/2" either side of the stopped position.

165 - If wipers are burned or damaged, entire upper mechanism shelf should be returned to the factory for replacement of these parts.

166 - IMPORTANT: Never, unless absolutely necessary, loosen the nuts which hold the stationary contact plates. These plates are aligned at our factory and to re-align same without proper fixtures is extremely difficult.

PAYS SHORT OR "MISSES" OCCASIONALLY - DOES NOT SHOW "SCORE VOID"

167 - Most common causes - #3 reel still "bouncing" when payout sequence contacts numbers 8 and 9 close. #3 reel should be practically stopped when the finger drops in. Remedy by:

A. Adjusting #5 sequence contact to cut off spinner motor sooner. #5 cam may be turned by loosening set screw in hub.

B. Adjust brake on #3 reel (FIG. 5)

C. Adjust all three stationary contact discs in as shown in FIG. 5.
#3 reel stop finger dropping in too late, while #3 reel is "bouncing" or coming to rest. There should be 1/4" space on #9 cam before closing switch, when #3 reel stop finger drops in as shown in Figure 7. Readjust #3 reel brake to eliminate bounce at new position.

If trouble is prevalent on payouts from 4 on up sequence motor brake may not be holding properly. Motor must stop at or before half way past lobes on Nos. 8 and 9 sequence cam (SEE FIG. 8). Motor brake is small steel spring pressing against end of armature.

Mixer commutator must not stop with payout contacts on it closed. The follow thru contacts on it red to blue-yellow should always close when the payout contacts are closed to cause the motor to follow through until the payout contact is open. (SEE FIG. 9).

Make sure mixer commutator stops after follow thru switch opens. If it coasts to again make contact at follow thru switch, brake spring against side of large brass gear does not have enough tension. Adjust as shown in Figure 9. Do not adjust brake too tight or motor will not start on low voltage.

40th position break contact blades on Payout commutator step-up might not have enough tension (evidenced by sparking during payout) allowing payout relay to drop out.

Reels may be prevented from proper registration by dragging or rubbing on reel housing.

Check the payout commutator to make sure that it is resetting completely to zero position each time cam #6 closes.

PAYS SHORT - SHOWS "SCORE VOID"

Most common cause - Loose or damaged service plug connection or cut service cord. The slightest momentary break in current to the game will show "Void." Locate service cord so that patrons do not lean against it.

Improperly adjusted contacts on lock-in and tilter relay (shown by sparking during payouts). Adjust to more contact pressure.

Check fuse clips for tension on fuses. Also sometimes a fuse will be found with faulty internal connections, causing high resistance or momentary open circuits. Faulty clips or fuses will in most cases feel hot when touched.

Replay reset push button stuck "In" or contacts on same too close together.

Plumb tilt adjusted too close.

Extreme momentary low voltage caused by refrigerator motor, etc., on the same service line starting, may allow the anti-tilt relay to drop out.

PAYS OUT TOO MUCH

Check drive springs, etc., on payout commutator to make sure that it STEPS UP ONE FULL TOOTH each time the coil is energized.

Make sure that the stationary disc on payout commutator has not come out of adjustment.

PAYS OUT WHEN COMBINATIONS SHOW ON REELS 1 & 2 ONLY

Check contacts and connections on Bar relays.

Make sure none of the long blades are sprung out of slots in Bakelite pull down plates on the bar relays, keeping certain contacts closed.
REPEATING OR CYCLING

185 - This may be checked by watching the sequence motor while operating the machine. It should stop at least once for an indefinite length of time each time the machine is played.

186 - If it does not do this make sure that the mixer commutator motor is being energized so that it will run by current furnished from the pair of contacts on the winning row selector coil. (FIGURES 6 and 9).

187 - Also check the contact on the mixer commutator motor blue-red-white to red-yellow to make sure that it closes each time a rivet passes under it. These contacts operate the sequence motor while #4 cam is open.

188 - Also #4 sequence contact should be checked for proper opening to allow sequence motor to be energized only by the mixer contacts while #4 is open.

189 - If brake on sequence motor armature is too loose, sequence motor will fail to stop completely. (This will also cause "short payouts" on values over 4) SEE FIGURE 6.

WINNING ROW LITES CHANGING WHEN REELS ARE STOPPING

190 - Armature spring on release coil may be broken or out of adjustment.

191 - Clutch spring should only be tight enough to carry disc around. Too much tension will cause backing up of disc. Factory setting is with the collar even with end of shaft.

192 - Correct adjustment to remedy "backing up" is by changing position of coil bracket (FIGURE 6). Armature when pulled in should just clear disc and entire assembly should be slanted somewhat with tip of armature tending to point away from center of main shaft.

NOISY COIN CHUTE LOCK COIL

193 - Armature on this coil must positively seat against core of coil. If reject pin on armature hits against side of its hole in slug rejector before armature seats, considerable noise will result.

194 - Armature spring may have too much tension.

REEL BRAKE ADJUSTMENTS

195 - The reel brakes should be adjusted so that when the game is operating on about 115 volts that the reels do not try to bounce back more than approximately one quarter position each way.

196 - A - #5 sequence contact may be adjusted to cut off the spinner motor sooner. (#5 cam may be turned by loosening set screw in its cam hub).

B - Reel brakes may be adjusted as shown in Figure 5.

C - All three stationary contact discs may be adjusted as shown in Figure 5.
CHECKING FOR PROPER OPERATION & ADJUSTMENT

The game will always function properly if it is checked or serviced regularly to prevent occurrence of difficulties. The points to be checked are extremely simple and are outlined below.

IMPORTANT:— After the game has been in operation one week, be sure to check it thoroughly according to the following points as, by that time, the reels, bearings, motors, etc., will have had a chance to wear themselves in.

1 Check for reel "bouncing"— operate the game with a coin and make sure that the reels are slowed down enough when the stop fingers drop in that they do not bounce back over one-quarter position. Procedure for adjusting the reels is given on Page 14, paragraphs 194 & 195, and also Figure 5.

2 Make sure that reels are not rubbing against the metal top housing assembly at any point to prevent them from registering properly all around.

3 Check timing of closing of sequence cams #8 and #9 on a payout. There should be 1/4" space on #9 cam before closing the switch when #3 reel stop finger drops in. This is shown in Figure 7.

4 Check brake on sequence motor so that on a payout it is completely stopped before the halfway point on sequence cam #9. See Figure 8 for proper adjustment.

5 Check operation of all three contacts on the mixer commutator assembly as below: (See Fig. 9).

   A - Mixer commutator must start when winning row selector armature is pulled in. It must stop the sequence motor at least once right after the start of each play.

   B - Check operation of payout contacts on mixer commutator motor assembly for good closing to provide positive payout action.

   C - Check follow-through contact on mixer commutator assembly and brake which operates in conjunction with the same, as shown in Figure 9.

6 Check all relay contacts for dirt and proper adjustment. Improper operation of relay contact will be shown by sparking during the period which they are closed during operation of the game.

7 Check adjustment of coin trip switch so that coins cannot hang up on it as shown in Figure 4.

8 Check coin guides below trip switch and also check separator assembly so that coins cannot hang up at these parts under any conditions, paying especial attention to the top moving edge of the check separator which should still be outside of the coin guides when the reject button is pressed.

9 Make sure that service plug and socket is tight making good connections.

10 Lubricate only if necessary, as described on Page 4.
CHECKING FOR PROPER OPERATION & ADJUSTMENT.

The valve will always provide proper fit if it is mounted, or replaced properly, to prevent insertion of difficulties. The guide to be polished by aluminum oxide and the mounted valve.

1. Check for out of alignment — operate the valve with a valve and make sure that the valve will stay on or off when the valve is closed. Close and open the valve. Make sure the valve is always in the same position. If it is not, then the valve is not operating correctly and must be rechecked.

2. Check the valve against the metal. Any loose parts in the valve should be checked by removing the valve from the body and inspecting it. If the valve is loose, it should be replaced.

3. Check for proper alignment of the valve. If the valve is not aligned properly, it will not operate correctly. If the valve is not aligned properly, it should be rechecked.

4. Check the operation of the valve. If the valve is not operating properly, it should be rechecked.

5. Check the operation of all three valves on the machine. If the machine is not operating properly, it should be rechecked.

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[Notes and diagrams]

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