

ARISTOCRAT
SERVICE MANUAL
ADJUSTMENTS AND SERVICE INSTRUCTIONS

REGAL MK. II.

ARISTOCRAT

SERVICE MANUAL

ADJUSTMENTS AND SERVICE INSTRUCTIONS

REGAL MK. II.

MECHANISM

Slides (Mechanical Machine)	Pages 1
Turret Type Throat 55	2,3,4
Dual Play Type Throat 194	5
Straight Type Throat 171	6,7,8,9
Drag Arm	9,10
Main Operating Arm	11
Back Axle, Trigger, Kicker	12,13,14
Payout Lift	15
Payout Lift Release	16
Stopper Arm Lift	17
Stopper Arms	18,19
Reels	20,21
Clock	22
Sequence & Timing of Movements	23
Springs - General	24

E.P.U. MODELS ONLY

TOP BOX	25
PAYOUT HOPPER	26
Motor	26
Brake	27,28
Disk & Coin Runner	29
Coin Counting Switch	30
Pay Faults	30
TROUBLE CHART	31

Revised July 1976

P28,30 Trouble Chart

Items 1 & 6

ADJUSTMENTS AND SERVICE INSTRUCTIONS

ALL MECHANICAL MODELS

Payout troubles stem from faulty slides, most of which can be avoided with proper maintenance.

It is recommended that the payout slides be removed from the mechanism at frequent intervals and cleaned and inspected.

They should be cleaned with hot soapy water to remove dust and any beer residue that may have been carried through on the coins. They should be thoroughly dried and polished with a soft lint free cloth.

Check that all wiper springs are intact and that they are set correctly, i.e. that the under face of the spring is flush with the bottom face of the slide and the tip or point does not project into the bore of the slide. Reset or replace any faulty ones. See Fig. 1.

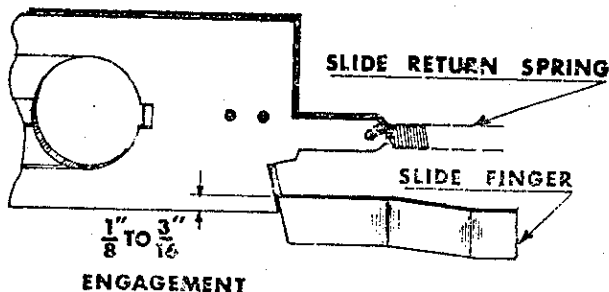


FIG. 2

most important, it is much better to replace a spring at a minor expense than to suffer payout troubles because of inadequate slide spring tension, this applies particularly to the Master (or Bottom) Slide spring.

After replacing the slide stack it is wise to check the slide finger (knife) engagement with each slide. Each slide finger should engage the slide it controls approximately in the centre of the slide thickness and to a depth of between 1/8" to 3/16" when the slide is at rest on the finger. See Fig. 2.

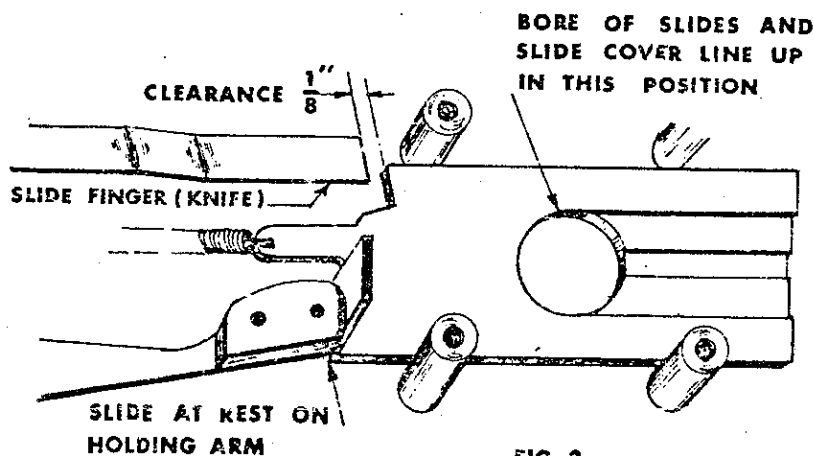


FIG. 3

PAYOUT SLIDES

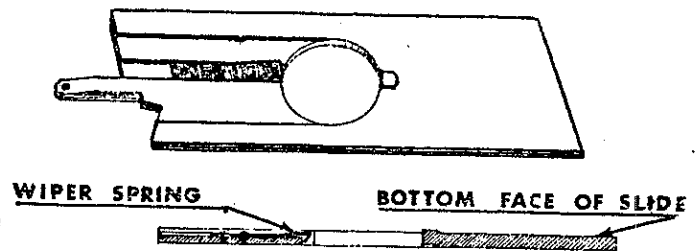


FIG. 1

Carefully inspect each slide return spring for breakage or fatigue. Fatigue can be recognised by the coils of the spring not being tight against each other (that is, if held up against the light daylight can be seen between coils) or general feeling of softness when bending the spring. Broken eyes or other breakages should not be repaired by shortening the spring, the spring should be replaced. Shortening the spring will increase its tension and cause excessive wear on the slide sides, slide fingers, and slide holding arm pad.

These slide springs do a lot of hard work and their fitness to perform their function properly is

Slide finger clearance should also be checked to ensure that, when the slides are at rest on the Slide Holding Arm pad, the clearance between the tip of the slide fingers and the slides is correct. This clearance should be 1/8" as shown in Fig. 3. If it is greater, the slides being released will cause an excessive wear to both slide face and fingers. Therefore it is important that slides or fingers showing wear should not be filed but replaced, as filing will increase the recommended gap.

COIN TRIGGER

When the coin has been removed from the 'PLAY' position in the Throat by the Coin Hammer it travels down the trackway and falls in to a pocket in the Throat Turret. Each time the machine is played, this Turret is turned in such a way that an empty pocket always comes into line with the Throat Trackway ready to accept the coin being played. The Turret is turned an exact amount by an "ESCAPEMENT" lever, mounted on the backplate of the Throat and linked with the Drag Arm. The main purpose of the Turret is to display the last coin used to operate the machine, for as long a period as possible, to discourage the use of spurious coins. However, it performs another very important function.

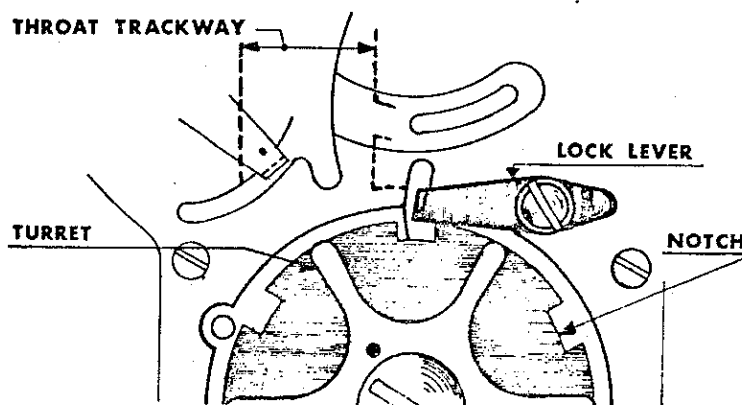


FIG. 8

If a player, attempting to cheat a machine, manages to get a device in the 'PLAY' position, e.g. a slotted coin, that will allow a full stroke of the main operating arm, i.e. a free play, the Turret will rotate with the first play but will not receive a coin. Therefore the empty pocket will rotate to the next station and allow a 'LOCK-LEVER' to fall into a notch in the Turret, see Fig. 8. This will prevent any further movement of the Turret and Throat Drag Arm which are linked together. The next time the handle is pulled, the Throat Drag Arm is prevented from moving and is not able to give the DRAG ARM STOP, situated immediately underneath the Main Operating Arm, its full travel, thereby locking the whole machine and making it inoperative until the device is removed from the Throat (see Fig. 9).

When a coin becomes jammed in the 'PLAY' position of the Throat, the Coin Hammer and the Throat Drag Arm, which are linked together, are unable to complete their full travel. This also means the locking of the whole machine by the Drag Arm Stop underneath the Main Operating Arm. Again, the machine can be operated only if the jammed coin is removed from the Throat.

For further explanation and service on the Drag Arm Stop see separate description.

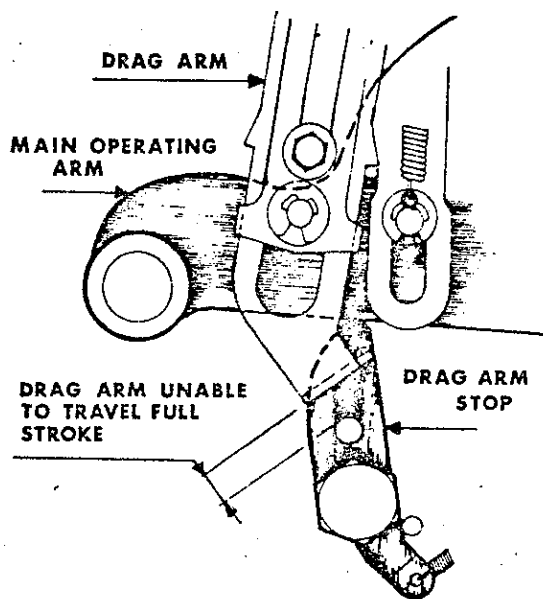


FIG. 9

THE THROAT OR ESCALATOR - ROTARY TURRET TYPE

FITTED TO ARISTOCRAT 'NEVADA' AND 'GROSVENOR' MODELS

The Throat or Escalator is a device attached to the machine mechanism for the purpose of using an accepted coin as a medium to release the machine for play.

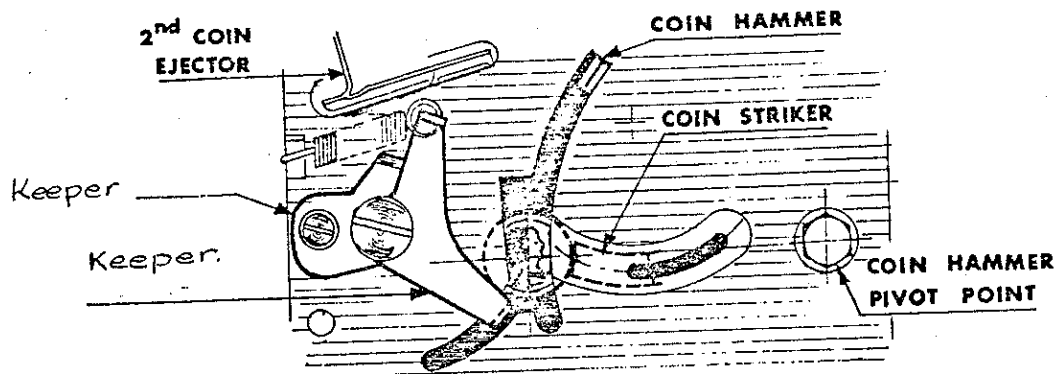


FIG. 4

An accepted coin, i.e. one that has passed the various coin checks in the coin selector, drops into the Throat and comes to rest on the Coin Trigger in a position opposite the Coin Striker (or Sensor). This position is called the "PLAY" position. See Fig. 4.

COIN TRIGGER SETTING

The Coin Trigger is adjustable by means of a Coin Trigger Stopper, located underneath it, and can be adjusted to raise or lower the position of the coin. The correct position is where the centre of the coin is exactly opposite the centreline of the Coin Striker. This position can be obtained by lining up the centre of the coin with the centre of the Coin Hammer pivot point. See Fig. 4.

When the coin is in the "PLAY" position, pulling the handle of machine down brings the Striker into contact with the coin. This movement holds the Free Play Lock out of engagement with the stop on the Main Operating Arm, allowing the machine to be played.

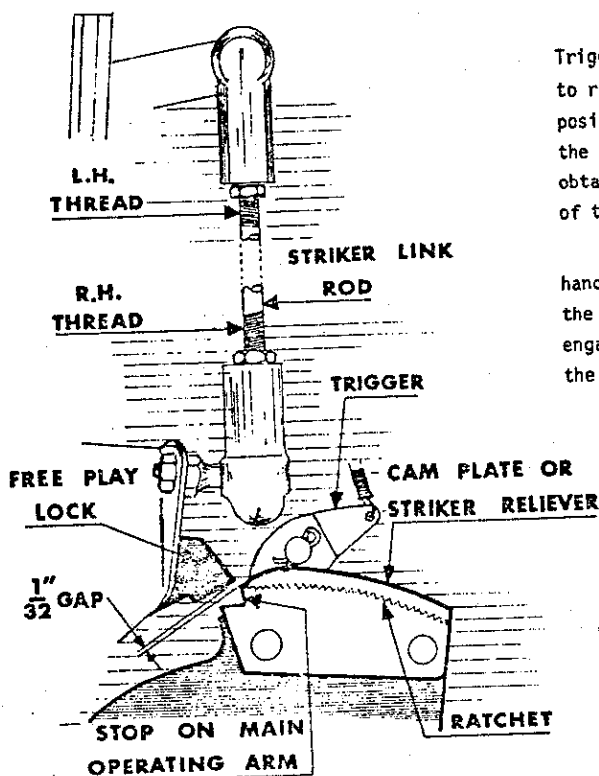


FIG. 5

FREE PLAY LOCK SETTING

The relative position of the Free Play Lock to the Main Operating Arm-Striker Reliever can be adjusted by means of screwing the Striker Link Rod "clockwise" to shorten or "anti-clockwise" to lengthen. The correct setting is obtained when the coin is in the "PLAY" position and the Coin Striker is in contact with the coin (see Fig. 4). The clearance now, between the tip of the Free Play Lock and the start of the cam plate or Striker Reliever, must be $\frac{1}{32}$ ", see Fig. 5.

DOUBLE PLAY THROAT MODEL 194

[DUAL PLAY]

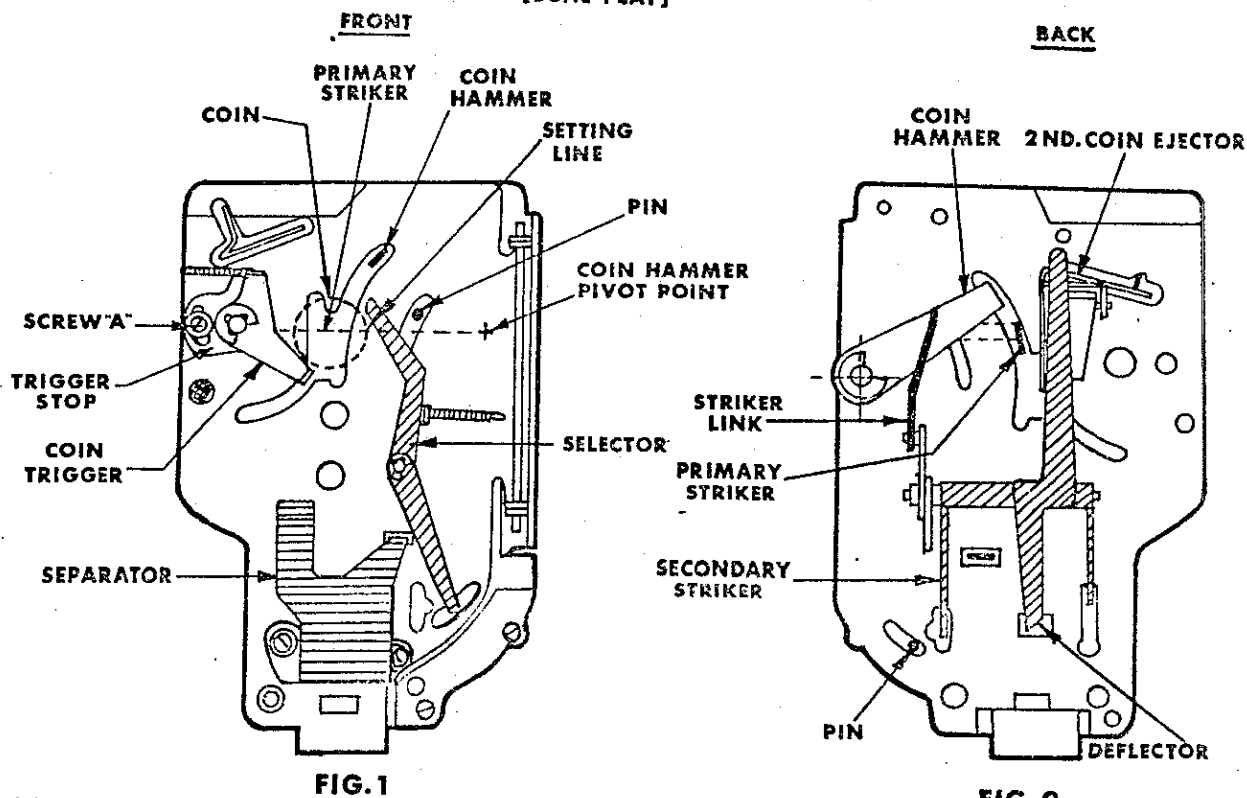


FIG. 1

FIG. 2

(a) COIN TRIGGER SETTING.

Correct coin trigger setting requires the centre of coin to line up with tip of touching striker. This is the "1st play" position.

Adjust coin trigger stopper, so that coin centre lines up with coin hammer pivot point. To do this, slacken coin trigger screw "a", rotate stopper as required and tighten screw. When coin is in correct "1st position", pulling of machine handle down brings striker in contact with coin, holding free play lock out of engagement with stop on main operating arm, allowing the machine to be played.

(b) FREE PLAY LOCKING SETTING.

The setting is the same as described on ~~54-35~~, pages 2 and 3, for rotary throat, except that, due to a different striker type, the striker tip will touch the back of the coin instead of the side.

(c) COIN HAMMER & THROAT DRAG ARM SETTING.

The hammer is to be set by means of the throat drag arm so that, if a second coin is inserted, whilst machine handle is held down, the coin cannot drop into the "play" position, until free play lock is in locking position. For further information see ~~54-35~~ pages ~~4 and 2~~ but disregard setting line shown on Fig. 4.

(d) SETTING OF SECONDARY STRIKER.

When setting secondary striker - insert one coin and pull the handle down, bringing 1st coin into 2nd play position. Insert another coin and check whether primary and secondary striker simultaneously touch coins. Should the secondary striker be late or advanced, slacken screw "b" on secondary striker Fig 3, and adjust striker as required. Tighten screw and check again.

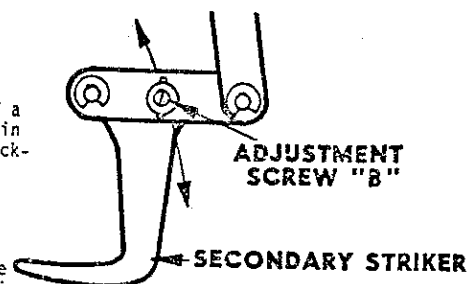


FIG. 3

STRAIGHT THROAT 171

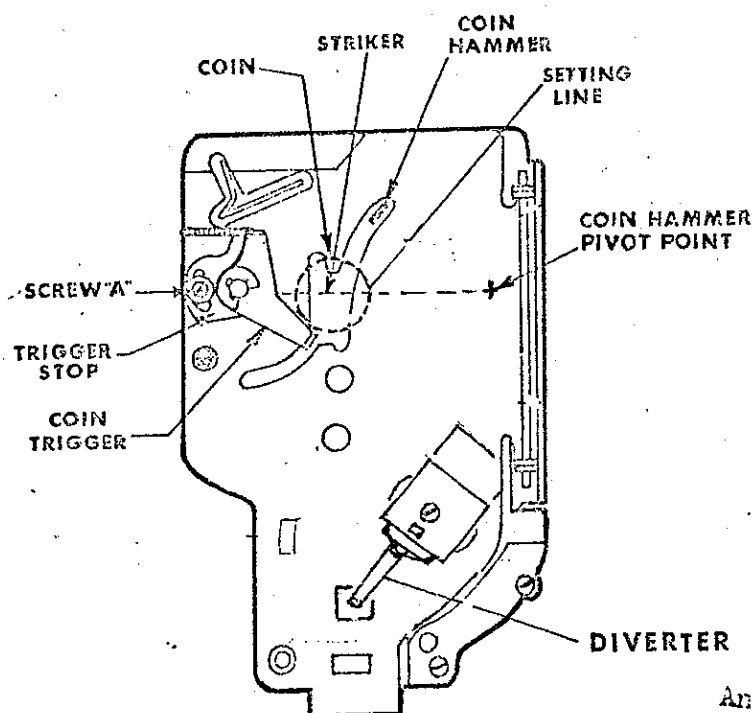


FIG. 1

COIN TRIGGER SETTING

Correct coin trigger setting is such that the tip of the striker touches the coin at its centre. Adjust the trigger stop by screw "A" so that the coin rests with its centre in a line with the pivot (see fig 1).

When pulling the handle brings the striker in contact with the coin, the free play lock should be held up out of engagement allowing the machine to be played.

COIN DIVERTER

An electrically operated arm deflects coins into the cash box when the hopper is full. Rising coin level in the hopper bowl earths its insulated contact and energises the diverter. Check by earthing the level contact with a screwdriver. When the coil pulls the arm in it must touch the coil pole piece or the assembly will buzz. It will also buzz if prevented from sitting flat by its screws protruding. Check that the arm protrudes far enough into the trackway to divert all coins otherwise overfilling of hopper will cause jams to hopper and chutes.

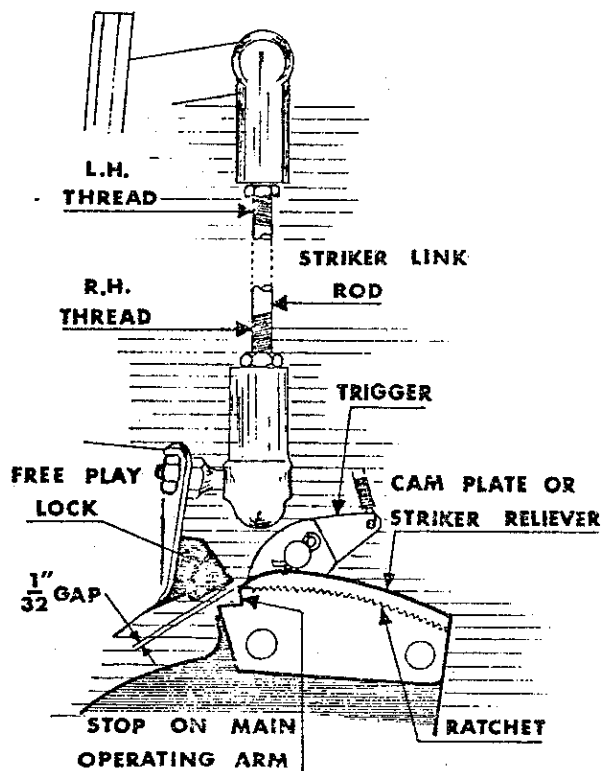


FIG. 5

FREE PLAY LOCK SETTING

The relative position of the Free Play Lock to the Main Operating Arm-Striker Reliever can be adjusted by means of screwing the Striker Link Rod "clockwise" to shorten or "anti-clockwise" to lengthen. The correct setting is obtained when the coin is in the "PLAY" position and the Coin Striker is in contact with the coin (see Fig. 4). The clearance now, between the tip of the Free Play Lock and the start of the cam plate or Striker Reliever, must be $\frac{1}{32}$ ", see Fig. 5.

It will be noted that when the Main Operating Arm has moved to a position where the Trigger engages the 1st and 2nd tooth of the Main Operating Arm Ratchet, a cam plate, known as the 'Striker Reliever' has come into contact with the underside of the Free Play Lock and has lifted it slightly. This, in turn, causes the Coin Striker in the Throat to move away from the coin so that it is quite free of any pressure during its movement from the 'Play' position.

THROAT DRAG ARM SETTING

The coin is moved away from its 'Play' position in the Throat as the handle is pulled to play the machine. This coin movement is achieved by a small lever, called the 'COIN HAMMER', which is pivoted on the backplate of the Throat (see Fig. 6). This Coin Hammer is connected to the Main Operating Arm of the mechanism by a link known as the 'DRAG ARM'. This Drag Arm is made up of two parts joined together by two screws in slotted holes to provide adjustment of its length.

To obtain the correct length of the Drag Arm, which is most important, the Free Play Lock must be fully engaged on the stop of the Main Operating Arm, at the same time the lower edge of the Coin Hammer should be in line with the corner of the slot in the Throat Front (see Fig. 6 & Fig. 6a).

To maintain this setting, the two links that form the Drag Arm are set in the factory and locked by means of a 'Pop' rivet inserted between the two adjustment screws (see Fig. 7).

Should it be necessary to readjust the Drag Arm length this Pop rivet must be drilled out. After the Drag Arm has been readjusted it should be locked again by re-drilling the rivet hole and fitting a larger size rivet.

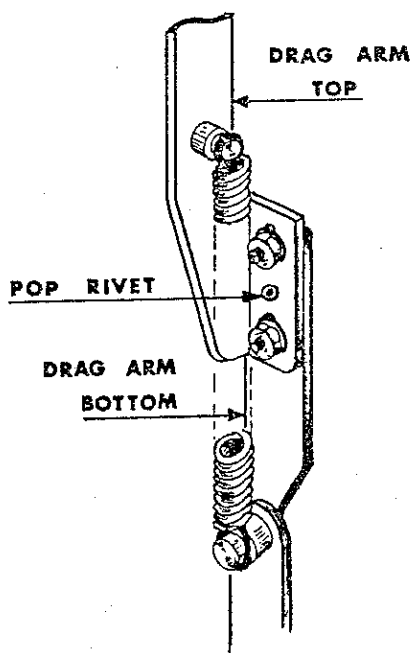


FIG. 7

This setting is designed so that if another coin is inserted while the machine handle is held down, it cannot get into the 'Play' position in the Throat before the Free Play Lock engages the Main Operating Arm. This is to prevent the machine from being played again whilst the pawl is in its reversed position, i.e. on its back and therefore in-operative. If it were possible to play the machine under these conditions then the REELS could be 'WALKED', that is, jiggled into a pay position by backward and forward movement of the handle.

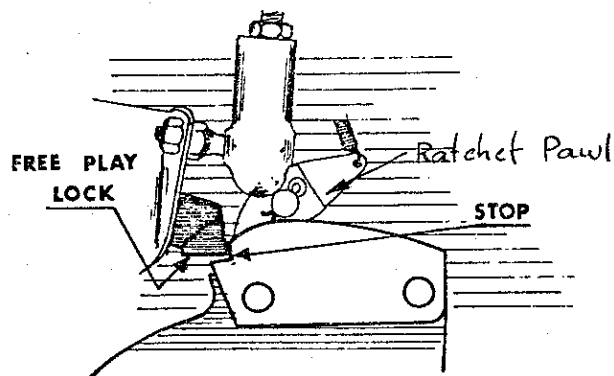


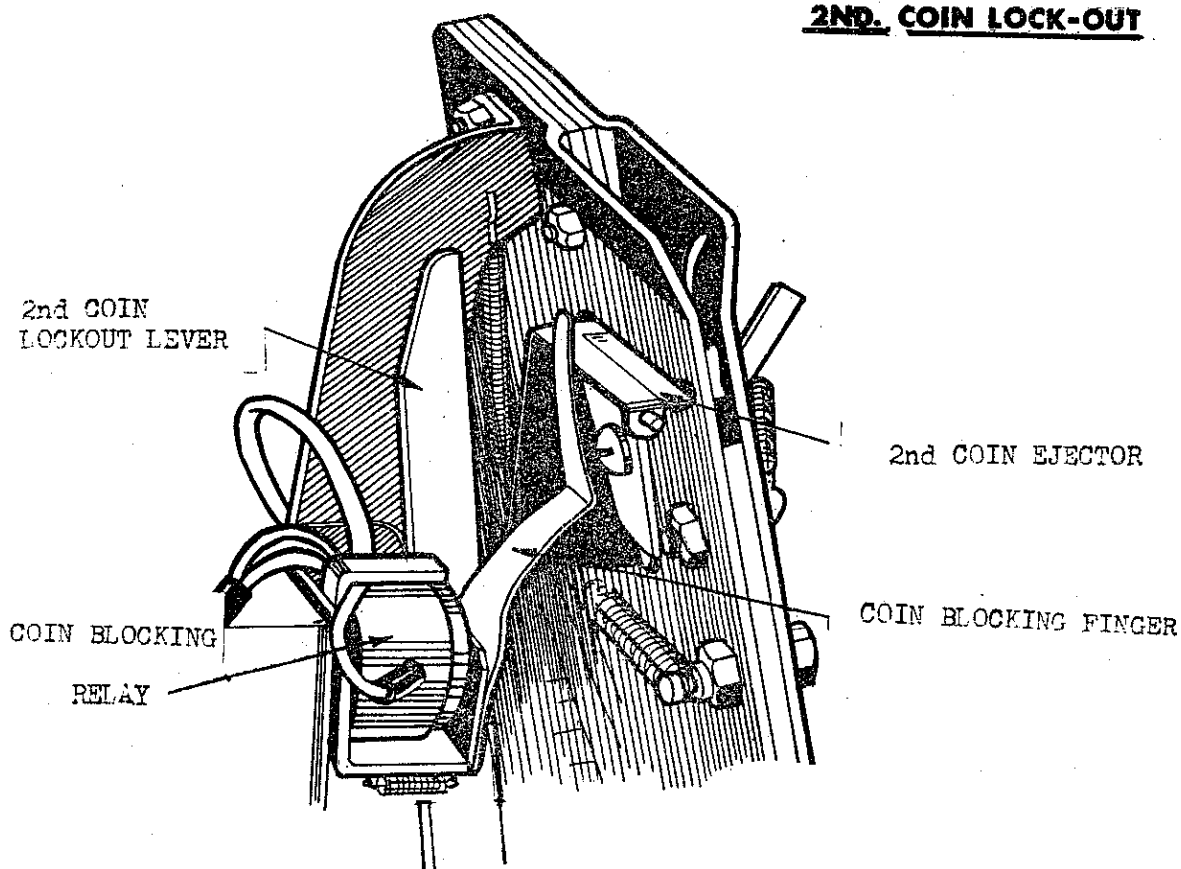
FIG. 6a

COIN HAMMER

SETTING LINE

SETTING OF
COIN HAMMER

FIG. 6

2ND. COIN LOCK-OUT**COIN LOCK-OUT**

The "2nd Coin Ejector" diverts coins to the reject cup under 3 conditions.

1. By gravity:
A coin in the "Play" position tilts the ejector forward causing a second coin to be rejected until the handle is pulled. (This is where the name of the component originated.)
2. by 2nd coin lockout lever:
This lever comes forward when handle is pulled and it tilts the 2nd coin ejector forward to reject coins at all times except when handle is upright.
3. Electrically by coin blocking relay:-
When power is applied the coin blocking finger is retracted. When power is off all coins are rejected. Power to this relay is cut during pays so that coins cannot be inserted until pay is completed.

THROAT -- GENERAL MAINTENANCE POINTS

It is a wise practice to carry out the following maintenance on a regular basis:

1. Remove Throat Front Plate assembly and clean all the trackways. Check that the passage of the coin through the trackway is free and not obstructed.
2. Inspect the COIN STRIKER for wear or distortion and, if necessary, restore or replace. Lubricate trackway of the Coin Striker and Pivot Point with a dry lubricant such as graphite powder. DO NOT USE OIL.
3. Check the Second Coin Ejector for distortion or stiffness, or for fouling on the sides of the slot in the Throat Back Plate.
4. Check Coin Hammer Pivot Pin and Throat Drag Arm Pin, the last one located in the Main Operating Arm, for wear. If worn excessively, mostly because of insufficient lubrication, the pins need to be replaced otherwise the machine could become jammed.
5. Check that the discharge of the coin from the Throat into the Down Tube is not obstructed.
6. Lubricate Pivot points of all moving levers, except the Second Coin Ejector and Coin Striker, with a drop of SAE30 oil.

DRAG ARM STOP

If for some reason the Throat fails to operate properly, a small but very effective device called DRAG ARM STOP, comes into action. It protects the various mechanisms of the Throat against any damage that could occur. The Drag Arm Stop is situated immediately below the main body of the Main Operating Arm and is pivoted on a Pivot Screw mounted on the Main Side Frame. It stands in a vertical position when the machine is at rest, in reality it is about 10° on the left hand side of the vertical. It can be observed then that the Stop in this position would prevent the Main Operating Arm from completing its travel. However, it is normally moved out of the way by the lower end of the Throat Drag Arm which strikes a pin on the Drag Arm Stop. See Fig. 9.

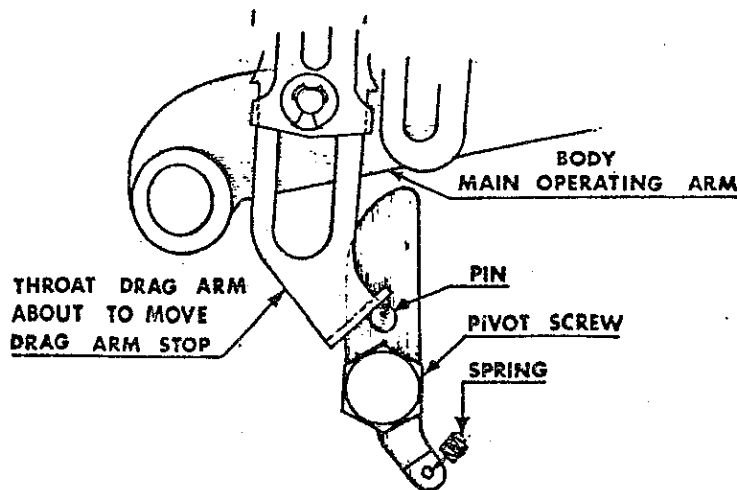


FIG. 9

As previously described the Throat can become inoperative or jammed. It will be seen then that because of this, the Drag Arm Stop would not be moved out of the way by the Drag Arm and therefore would prevent the Main Operating Arm from completing its movement. This condition would also prevent any strain being transmitted to the various parts of the Throat and any pressure applied to the handle of the machine would be taken by the Drag Arm Stop.

In some cases it may be necessary for a mechanic to clear the obstruction or jam that has occurred.

It is important that the Drag Arm Stop is checked from time to time to make sure it is operating correctly. This is easily done by playing the machine and stopping the THROAT COIN HAMMER from moving through its full travel; a screwdriver could be used to achieve this. If the Drag Arm Stop is working correctly the machine should NOT be able to be played. Failing this, the Drag Arm Stop should be checked for the following defects:

1. A fatigued or broken spring which prevents the return of the Drag Arm Stop to the vertical position at rest. Replace spring.
2. Tightness on the Pivot Screw, which would also prevent it from returning to its proper position. Clear tightness to give easy movement and lubricate with SAE30 oil.
3. Wear on the tip of the Drag Arm Stop. This allows the Main Operating Arm to move it out of its way without the action of the lower end of the Throat Drag Arm. Replace Drag Arm Stop.
4. Malfunction of the ramp section of the lower end of the throat Drag Arm. Adjust.
5. Wear on the underside of the Main Operating Arm caused by the incorrect setting of the Throat Drag Arm. This causes continual rubbing of the Main Operating Arm on the Drag Arm Stop. When set correctly the Main Operating Arm should NOT touch the Drag Arm Stop until it has travelled to the position shown in Fig. 10.

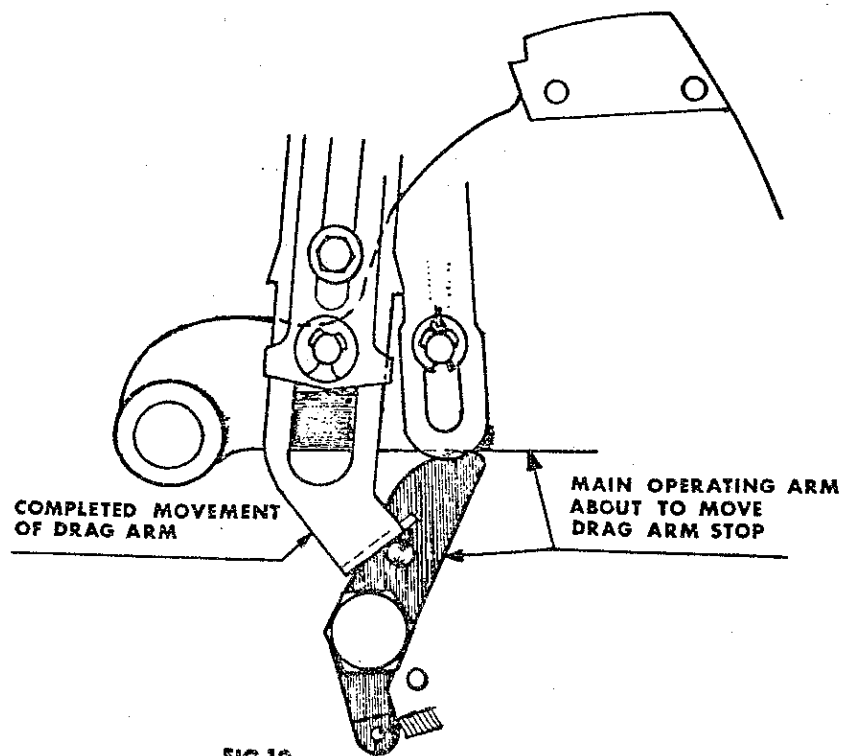


FIG.10

MAIN OPERATING ARM

Check regularly as follows:-

- (1) Ratchet and striker reliever. The ratchet is the most vulnerable part of the main operating arm. It should be carefully inspected for wear or damage.

When replacing ratchet laminations, (P/No. 55/1325 4 off) also replace striker reliever (P/No. 55/1323).

- (2) Trigger and trigger spring, replace if necessary.
- (3) All pins and nylon rollers. Special attention to be given to trigger pivot and trigger limit pin. These parts, when worn, will upset back axle action.
- (4) Lubrication - use SAE 30 oil for pivot pins, grease for ratchet and pins retaining sliding parts and spring hook pin for main operating arm spring.
- (5) Main operating arm pawl (P/No. 55/1510) on main side frame. Check for wear.
- (6) Pawl pivot pin (P/No. 55/1511) on main side frame. Check for wear and keep well lubricated.

SETTING OF BACK AXLE ["MAYFAIR" E.P.U AND "EUROPA" MODELS]

- (a) Check whether the back axle trigger is in nearly horizontal position (Fig 1). Mechanisms fitted with locally supplied sealed clock and requiring 15 seconds per game, require the trigger position to suit proper and secure action of payout lift. (The payout lift should not get stuck on payout lift release).
- (b) To set back axle, slacken lock nut of back axle adjustment screw (See Fig. 2) and adjust screw till required position of trigger is obtained.
- (c) With back axle set, spin last reel to ensure that kicker arm pad (Standard Mech.) or tip (Hold 'N Draw Type) clears payout plate when mechanism is at rest.
- (d) Tighten locknut.
- (e) MAINTENANCE POINTS

It is advisable to check regularly as follows:-

- (1) Correct position of back axle trigger.
- (2) All back axle components for proper lubrication.

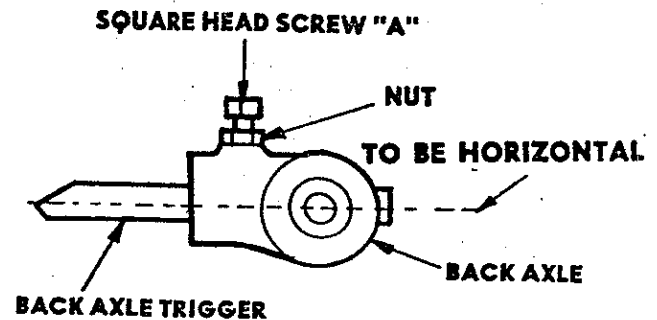


FIG.1

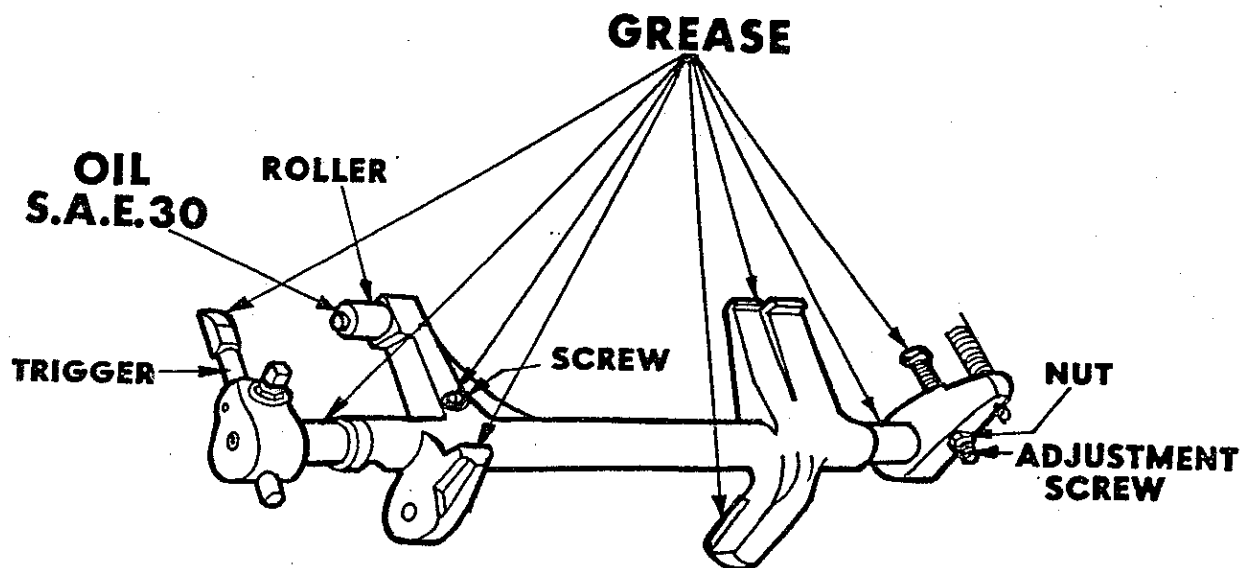
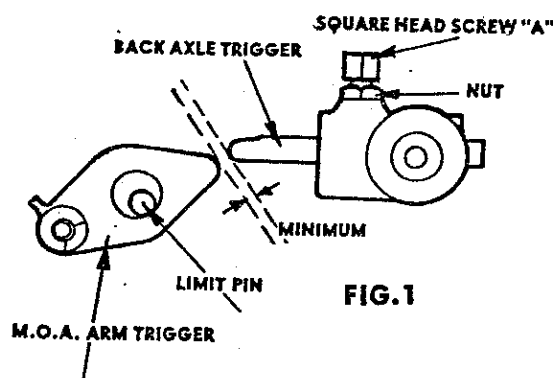
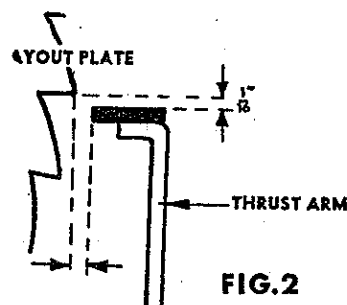


FIG.2

SETTING OF BACK AXLE TRIGGER

- (a) Set back axle trigger, in relation to main operating arm trigger, so that when main operating arm trigger is pressed upwards, (against its limit pin) there should be a minimum clearance between the stationary back axle trigger and the upwards moving main operating arm trigger (moving with the main operating arm).
- (b) To adjust back axle trigger, slacken screw "a" and set trigger for minimum clearance. Tighten screw but not lock nut and check that payout plate and thrust arm pad are engaged for mechanism at rest. When handle is pulled nearly down, kicker arm pad must travel from engagement position to $3/16"$ beyond next two payout plate teeth, as shown in Fig. 3. Stopper arm release should clear small side frame by $1/4"$ to $1/2"$.
- NOTE:** The "Hold 'N Draw" type kicker arm (3 individual kicker levers) is based on the same geometry as the above mentioned kicker arm and has to satisfy the same conditions. On mechanisms fitted with locally supplied sealed clock and requiring 15 seconds per game, there will be an increase from $3/16"$ to $5/16"$, depending on clock performance and back axle setting.

**FIG. 1****FIG. 2**

Back axle trigger should be now in the slip-off position. At the same time, payout plates must rest with their teeth on pad of thrust arm.

Complete pulling down of handle disengages both triggers, allowing kicker arm to "kick" reels.

- (c) If above conditions are not satisfied, adjust back axle trigger again. If setting is correct, tighten lock nut and check again.

The minimum clearance requirement, as shown in Fig. 1 should suffice in most cases.

When back axle trigger is set too long, it may not disengage and cause excessive travel of follow-on parts, like slides, kicker arm, payout arms etc. When back axle trigger is set too short, it may result in kicker arm missing out.

Once the back axle trigger is set it should not be interfered with.

- (d) **MAINTENANCE POINTS.**

It is advisable to check regularly as follows:-

- (1) Main operating arm trigger - inspect for wear and lubrication. A worn part should be replaced, resetting of back axle trigger may be required.
- (2) Back axle trigger - inspect for wear and lubrication. A worn part should be replaced, correct setting of part is mandatory.

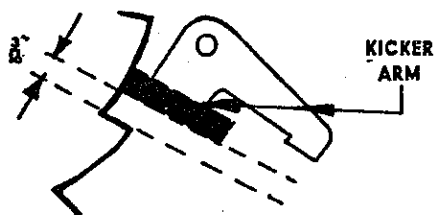


FIG.3

- (d) (3) Main operating arm trigger pivot pin-inspect lubrication.
(4) Standard kicker arm - inspect for wear (pad) and lubrication. Grease roller contacting parts and pad. Use SAE 30 oil for pivot points.
Hold 'N Draw type kicker arm - inspect for wear (tips) and lubrication.

LUBRICATION.

- Item 1 & 2 - Use heavy grease for tips.
Item 3 - Use a drop of SAE 30 oil or use light grease.
Item 4 - Use SAE 30 oil for moving parts.

ARISTOCRAT SERVICE MANUAL

SETTING OF PAYOUT LIFT
[ADJUSTABLE TYPE]

Correct setting of payout lift requires at slip-off phase of back axle trigger and main operating arm trigger (see setting of back axle trigger - SM.4) that the payout lift roller should be $1/16"$ to $3/32"$ above payout lift release (See Fig 1) and that payout arm tips clear 1st payout plate by approximately $1/8"$.

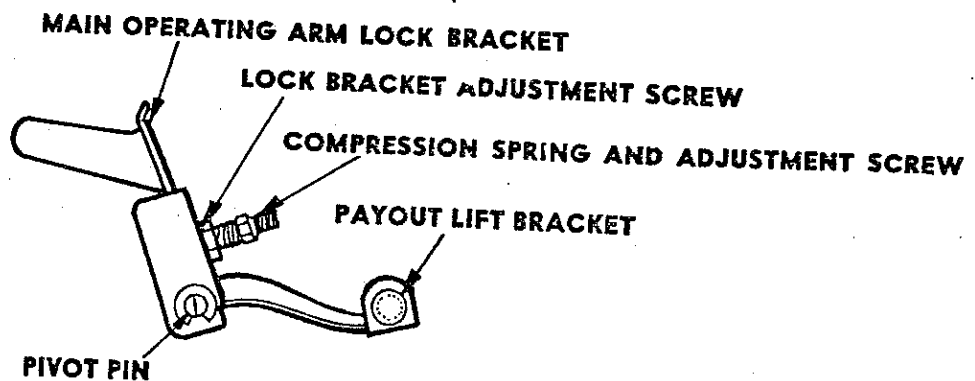
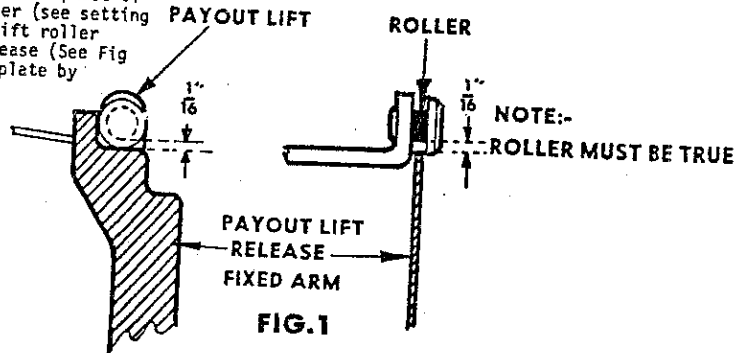


FIG. 2

To set payout lift, set payout lift adjustment screw (located on roller carrying outrigger of back axle) so that roller of payout lift bracket clears the fixed arm (when back axle is operated) by $1/16"$ - $3/32"$ (See Fig 1). Care is to be taken that payout lift bracket does not foul thrust arm or back stay. Should this be the case, take payout lift out by undoing the pivot pin. Having payout lift removed, bend the part so that the fouling condition will be eliminated.

NOTE: Insufficient roller clearance will result in payout lift dropping back and therefore in too early release of payout arms, causing a jam.

Proceed now to adjustment of lock bracket. Set the bracket adjustment screw so that the main operating arm lock bracket keeps the payout arm tips (after disengagement of main operating arm trigger and back axle trigger) $1/8"$ from the first payout plate. (This setting requires a special tool)

MAINTENANCE POINTS.

It is advisable to check regularly as follows:-

- (1) Position of roller above payout release arm and position of payout arms. Reset payout lift if required.
- (2) Inspect roller and pin (except when a ball race bearing is used) replace payout lift bracket in case of severe wear.
- (3) Inspect lock bracket for severe wear, replace if required.
- (4) Lubrication - use heavy grease on roller, lock bracket and underside of payout lift bracket.

SETTING OF PAYOUT LIFT RELEASE

This setting requires that fixed arm holds payout lift for 1 second (See * Note) after last reel has stopped. It ensures correct timing of payout arm action and action of 4th movement lock. To obtain correct timing, set adjuster arm, slackening screw and rotating adjuster arm. Opening up will speed up action, closing will slow it down, Fig. 1. Tighten screw and try timing. Repeat setting if required.

NOTE: Fast setting will produce too early action of payout arms, slow setting produces too late action of payout arms. The result is improper pay action with the possibility of a "no pay".

NOTE:* For mechanisms with locally supplied sealed clock and requiring a game length of 15 seconds, the time for holding payout lift after last reel has stopped is to suit the 15 seconds per game requirement.

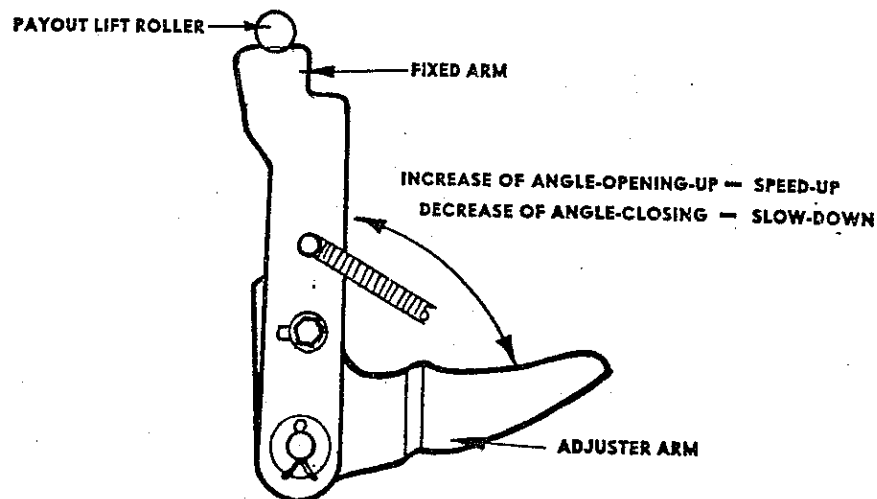
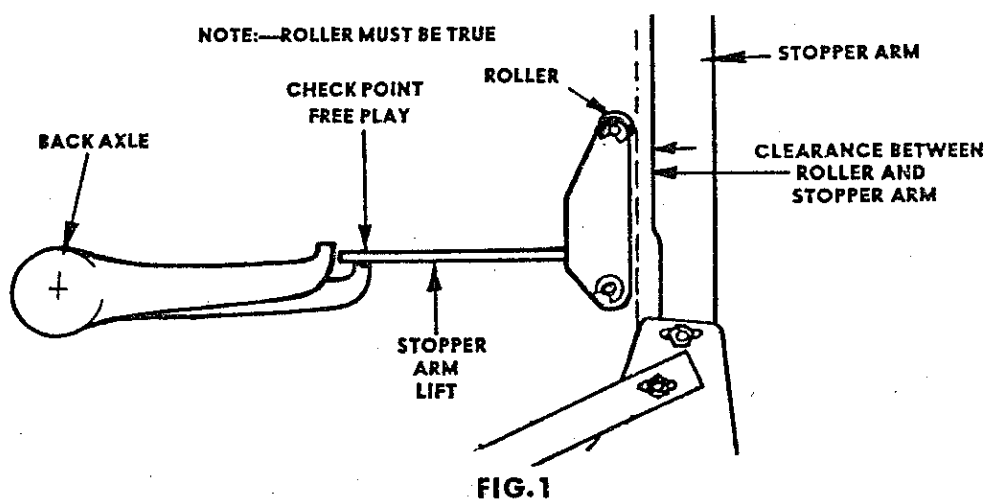


FIG.1

MAINTENANCE POINTS.

Check regularly as follows:-

- (1) Timing.
- (2) Inspect fixed arm for severe wear, replace if required.
- (3) Lubrication - use heavy grease on top edge of fixed arm and roller of clock arm, use SAE 30 oil for pivot of adjuster arm and roller pin of clock arm.

STOPPER ARM LIFT

Stopper arm lift tail should have free play from $1/32"$ to $1/16"$ when at rest position on back axle finger. Fig. 1.

To obtain this play, if need be, bend tail as required. Too much play may cause stopper arm feet to interfere with stopper arm release, causing a jam. Insufficient free play may cause stopper arm not properly engaging star wheel, with the result of payout plate slots and payout arms not lining up and therefore causing a "no pay".

MAINTENANCE POINTS.

Check regularly as follows:-

- (1) Free play of stopper arm lift, reset if required.
- (2) Lubrication - use heavy grease for lift tail, use light grease for lift roller contacting stopper arms and SAE 30 oil for roller axle and stopper arm lift axle.

SETTING OF STOPPER ARMS

The stopper arms are set for timing and correct clearance of star wheels.

(a) Clearance of star wheels.

The conditions to satisfy are that when stopper arm feet rest on stopper arm release, stopper arm heads must clear star wheels as follows:-

- (1) 1st arm approx. $3/16$ " clearance.
- (2) 2nd arm approx. $3/16$ " clearance.
- (3) 3rd arm approx. $1/4$ " clearance.
- (4) 4th arm approx. $5/16$ " clearance.

Maintenance of above clearances facilitates correct engagement of arms and star wheels. To set clearances slacken two screws and bring stopper arm head in correct position (NOTE: Stopper arm feet must rest on stopper arm release). Tighten screws.

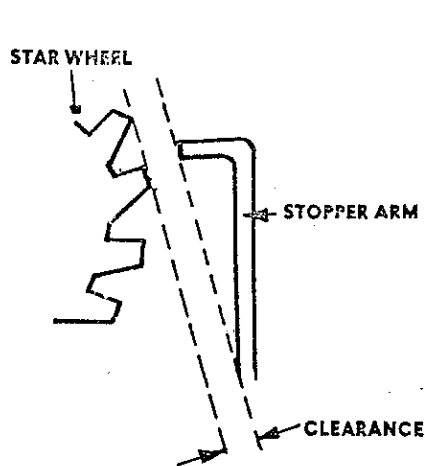


FIG. 1

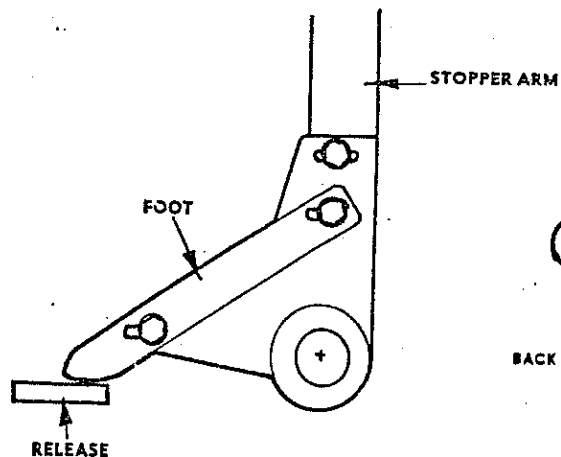


FIG. 2

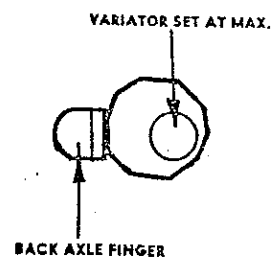


FIG. 3

(b)* Timing of stopper arms is done by setting of stopper arm feet to obtain following spinning times. (For mechanisms fitted with "Ainsworth" clock)

- (1) 1st reel $1\frac{1}{2}$ to 2 seconds, about 2 turns.
- (2) 2nd reel 1 second longer than 1st reel.
- (3) 3rd reel 1 second longer than 2nd reel.
- (4) 4th reel 1 second longer than 3rd reel.

To set stopper arm feet - slacken both screws (holding foot) and set foot as required, then tighten screws. Repeat until correct spinning time is achieved. Movement of foot towards release will lengthen spinning time, moving away shortens it. When stopper arm foot is set correctly, check arm head clearance of star wheel and adjust it if necessary.

* Note: 1st Stopper Arm (with eccentric disc)
has no adjustment

Now set clock variator on maximum, Fig 3, and check last stopper arm foot that it clears the oncoming stopper arm release when pulling handle down, otherwise the machine jams and cannot be played.

NOTE: Should timing of stopper arms be too short or too long, with feet not permitting more adjustment - straighten (lengthens timing) or close (shortens timing) clock fan. Take care not to bend fan gear spindle.

NOTE: Spin times for mechanisms fitted with "sealed" clocks (local supply) and requiring a game length of 15 seconds:

- (1) 1st reel - 5-6 seconds.
- (2) 2nd reel - 8 seconds.
- (3) 3rd reel - 12-13 seconds.

MAINTENANCE POINTS

Check regularly as follows:-

- (1) Clearance between stopper arm and star wheel.
- (2) Timing of stopper arms.
- (3) Inspect stopper arm feet for severe wear and replace if necessary.
- (4) Inspect stopper arm release for wear, replace if necessary.
- (5) Inspect free movement of stopper arm head.
- (6) Lubrication - use light grease for stopper arm head and stopper arm contact area, and for bushes, use heavy grease for stopper arm feet, use SAE 30 oil for stopper arm bosses.

SETTING OF REELS**(a) Check spinning and play of reels.**

The reels should spin freely with a minimum of play between them and a minimum of end play between the side frames, otherwise there will be binding or interference with stopper arms.

(b) Minimum play between reels is the first condition to be satisfied. Slacken hex head screws, 3/16" BSW to loosen clamps on reels (all reels except the last one). Bring reels in minimum play condition and tighten clamp screws.**(c) After setting reels for minimum play between them, check end play.** To obtain correct end play: loosen first lock nuts "b" and then screw "a". Now tighten inner lock nut until minimum end play is achieved. Tighten screw "a" and outer lock nut.**(d) Check relationship of reel symbols, corresponding payout plates slots and payout arms.** Following conditions are to be satisfied.

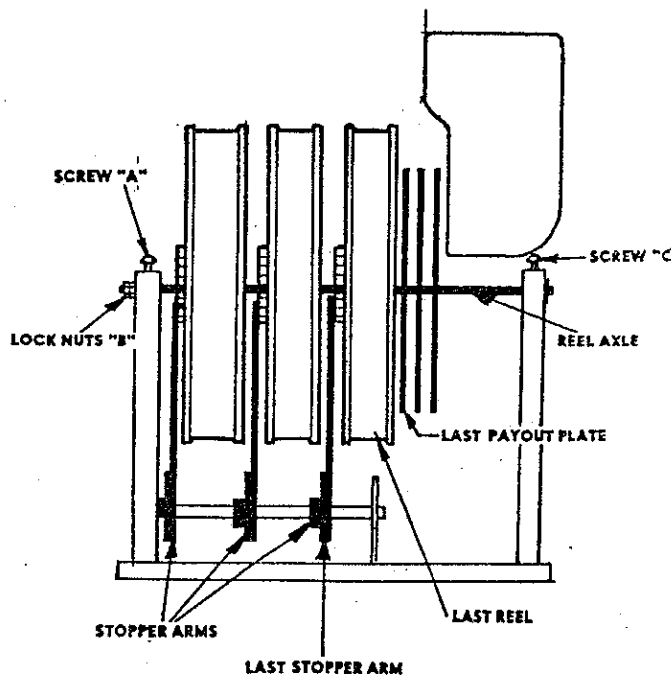
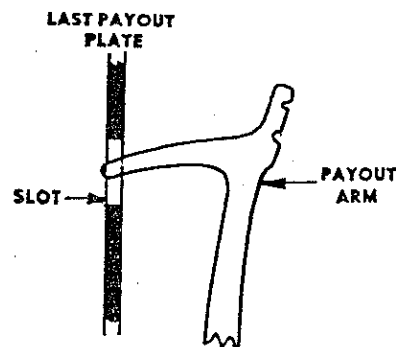
- (1) Symbols and payout plates slots must correspond.
- (2) Payout arm tips must be in centre of slots in payout plates.
- (3) Payout plate teeth must be 1/16" above and away from thrust arm pad.

To satisfy condition 1, pick on payout plates easily identified slots, say jackpot lineup, and let corresponding payout arm engage. Now check reel strip symbol lineup for agreement. (Corresponding lineup must be on readout line of reel). Any symbols not in line must be brought in position by slackening clamps or reel bosses and turning of concerned reels. Slightly tighten clamps.

To ensure that payout arm tips are in centre of payout plate slots, condition (2), bring last reel in a slot payout arm engagement position, Fig 2. Should slot be off centre, loosen locknut of last stopper arm and turn eccentric boss to bring slot in required position, tighten locknut.

To satisfy condition 3, check whether last payout plate (innermost) has tooth tip 1/16" above and away from thrust arm pad, should this not be the case, bend top of thrust arm accordingly.

Line up teeth of the remaining payout plates with last plate and evenly tighten clamps, this condition ensures that payout arms freely penetrate plates and that thrust arm and kicker arm will properly engage and operate.

**FIG.1****FIG.2**

(e) MAINTENANCE POINTS

It is advisable to check regularly as follows:-

- (1) Reel axle tubes should be kept clean and lightly oiled with SAE 10 oil.
- (2) Play between reels.
- (3) End play of reel assembly.
- (4) Relationship of reel symbols and payout arms.
- (5) Line up of plates.
- (6) Even tightness of reel clamps.
- (7) Check star wheels for signs of wear or damage and replace if necessary. If replaced, check payout plate lineup.
- (8) Check reels for binding. Cause maybe uneven clamping, dirty reel tube, or interference of other parts with payout plates or reel.
- (9) Lubrication of payout plate teeth. Heavy grease should be applied.

NOTE: To remove reel undo lock nuts "b", loosen screws "a" and "c". Unhook stopper arm spring and bring stopper arms out of engagement with reel.
Pull reel axle out on the R.H. side of circlip.

CLOCK MAINTENANCE

[AINSWORTH CLOCK]

Clock maintenance is most important. Clock should be kept clean and well lubricated. It is advisable to have clock covered when working on mechanism. The clock fan spindle is the most vulnerable part of the mechanism and easily bent, upsetting timing of clock or stopping clock. When removing dirt, use a fine brush, never use a screwdriver.

- (a) To clean clock (if necessary) remove same. Remove payout lift release, disconnect clock connecting link, unhook clock spring, unhook payout lift release spring, undo stop lever and unscrew both clock retaining screws (round head). Loosen clock mounting pad, by slackening both hex. head screws (underneath of base casting).
- (b) Take out clock and clean with a fine brush in a bath of carbon tetrachloride.
- (c) After blowing dry, inspect gears, ratchet and springs for wear and damage. Inspect pins, brushes, variator and variator pin for wear, (excessive play of pawls and spindles). Replace parts if necessary.

NOTE: Pawls should divide the ratchet tooth into four; Ratchet should be engaged by only one pawl at a time. When spinning clock, four distinct clicks should be heard. This indicates that pawls are not binding and pawl springs are intact. Pawl failure causes backlash, upsetting timing.

Checking of pawls is very important.

Lubricate all clock gears with molybdenum disulphide based grease. Lubricate bushes and pawls with SAE 10 oil. Lubricate ratchet with SAE 30 oil. Check clock for binding. Lubricate variator and clock roller with grease, lubricate variator pin and roller pin with SAE 30 oil. Replace clock (do not bend clock fan spindle), connect stop lever, attach clock connecting link, replace payout lift release, hook on springs and check action of clock. If machine cycle is too fast - open up fan as required.

ARISTOCRAT SERVICE MANUAL**RECAPITULATION OF MAIN MECHANISM MOVEMENTS**
["MAYFAIR" E.P.U AND "EUROPA" MODELS]

There are 3 stopper arm movements in a 3 reel mechanism and 4 stopper arm movements in a 4 reel mechanism. The next movement is the payout lift release movement.

Sequence and timing of movements:-

(a) For mechanisms fitted with "Ainsworth" clock.

- (1) 1st stopper arm - allows 1st reel $1\frac{1}{2}$ - 2 seconds spin.
- (2) 2nd stopper arm - terminates spin of 2nd reel, 1 second after 1st reel.
- (3) 3rd stopper arm - terminates spin of 3rd reel, 1 second after 2nd reel.
- (4) 4th stopper arm - terminates spin of 4th reel (on 4 reel mechanism) 1 second after 3rd reel.
- (5) Payout lift release - releases payout arms 1 second after spin of last reel.

NOTE: If time lapse is too big or too small, close or open fan blades. It is absolutely necessary that correct sequence is maintained without time interference.

(b) For mechanisms fitted with locally supplied sealed clock and requiring a game length of 15 seconds.

- (1) 1st stopper arm - allow 1st reel 5 - 6 seconds spin.
- (2) 2nd stopper arm - allow 2nd reel 8 seconds spin.
- (3) 3rd stopper arm - allow 3rd reel 12 - 13 seconds spin.
- (4) Payout lift release - to suit 15 seconds per game. Setting depends on clock performance.