

# Burroughs Instruction Book

on

## Type 60 Machines

PROPERTY OF AND TO BE RETURNED TO  
**BURROUGHS ADDING MACHINE COMPANY**  
DETROIT, MICHIGAN

BURROUGHS TYPE 60 MACHINE

The Burroughs Type 60 machines are equipped with motor returned carriage and motor operated shift key mechanism.

SELECTIVE MOTOR RETURN

The carriage can be returned to two positions viz: When the return key is depressed and held, the carriage will stop on the first margin block and limit on auxiliary stop X. However, when the return key is depressed and immediately released, the carriage will pass the first margin block and stop with the second on margin stop 1-108129.

MOTOR SHIFT KEY

When the shift key is depressed, the platen is raised and when the shift key is released the platen is brought down.

These instructions cover the following subjects:

Return Key Mechanism, Tests and Adjustments.

Return and Tabulating Tapes, their Removal and Replacement.

Shift Key Mechanism, Tests and Adjustments.

Motor Unit, Speed, Thermal, Fuse etc.

Spacing, Tests and Adjustments.

Removing and Replacing barrel spring assembly.

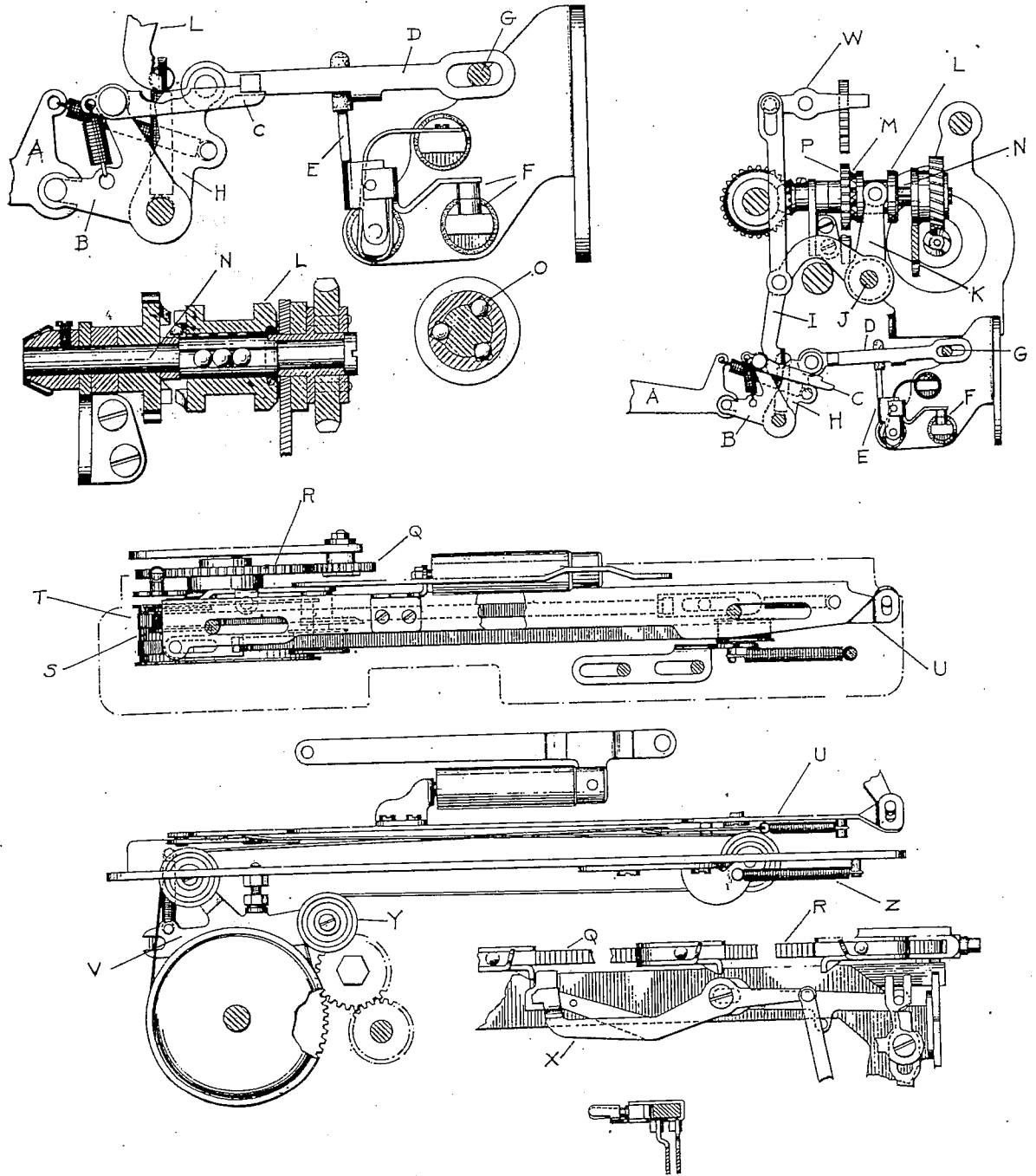
Auxiliary Margin Limit Mechanism.

Caution: Please note that the center screw on the left side in the back pawl is shorter than the other screws. This short screw is essential in order to clear the revolving switch and governor of the motor.

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# Return Key Mechanism

## Type 60 Machines



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## BURROUGHS TYPE 60 MACHINE

### RETURN KEY MECHANISM

When carriage return key is partially depressed, the switch points are allowed to come together first, to cause the motor to operate. Lever A rocks bell-crank B causing pawl C to contact on the square stud in link D, moving the latter rearward which allows switch lever E to follow and points F to come together causing the motor to operate. Link D pivots on bell-crank H and stud G.

When the carriage return key is completely depressed, bell-crank H moves out of the path of link I which moving downward rocks shaft assembly J, arm K moving clutch member L into clutch member M thus engaging clutch. Clutch member L moves laterally on worm wheel shaft N and slides on balls O in recesses of the shaft and clutch member L.

Clutch member M carries integrally gear P which is meshed with and revolves gears Q and R. The latter being fastened to spring barrel S revolves it winding tape T which is anchored to return slide U.

Return slide U moves in its slot sufficiently to space the platen before moving the carriage.

### CLUTCH DISENGAGEMENT

The carriage return movement is limited by the outer carriage contacting on the margin block which causes the tension of the return tape T to lower disengaging arm V, the latter rocks lever W which raises and resets link I.

## BURROUGHS TYPE 60 MACHINE

RETURN KEY MECHANISM  
Tests and Adjustments

The motor should be running while bell-crank H has a good hold on the ear of vertical link I.

Adjustment: Switch lever E is advanced toward link D.

When the carriage return key is normal, there should be not more than 1/64" clearance between the clutch members.

Adjustment: The bent ear of vertical link I is bent.

Return key normal, there should be a slight play in fork of lever W to prevent partial clutch disengagement.

Adjustment: Rubber limit post (post for disengaging arm V) is adjusted.

Test for bell-crank H: Since bell-crank H is spring connected to bell-crank B, bell-cranked H must move freely.

The return key is sufficiently depressed to trip bell-crank H and the key held in that position, link I is then moved upward, which should cause bell-crank H to immediately reset.

TO REMOVE SPRING BARREL ASSEMBLY

Remove tension of barrel spring, unhook and remove tapes. Remove rubber bumper for disengaging arm V, unhook spring from lever of shaft assembly J.

Remove guide roller.

Remove four screws holding the spring barrel assembly to the side frames.

Spring barrel assembly can now be removed.

The mesh of gears Q and R is fixed, however, the mesh of intermediate gear Q and driving gear P is adjustable. The plate which carries gears Q and R has a radial slot for gear Q which permits adjusting the mesh of gears R and P.

Caution: The nut which holds gear R must not be loosened or turned without holding the nut on the opposite side of the plate to which it is fastened. If the nut referred to is shifted without holding the other one, the ball bearing adjustment of the spring barrel will bind and cause serious trouble.

Caution: The brackets which support clutch shaft N must under no circumstances be loosened or removed on account of the difficulty in aligning it for the clutch shaft. Clutch shaft N can be readily withdrawn by removing the bevel gear.

## BURROUGHS TYPE 60 MACHINE

RETURN TAPE

The return tape is hooked from a pocket in the spring barrel, passes over the guide pulley on disengaging arm V and then is hooked to the stud in the left end of return slide U. The return tape should be fifteen inches long. When the carriage is tabulated to its complete left position, the tape hook should hook freely into the pocket of the spring barrel.

TO REMOVE RETURN TAPE

Place carriage in extreme left position, this unwinds the tape and locates the barrel spring pocket to permit unhooking the tape hook.

With screw driver the tabulating tape is moved off guide pulley Y in order to provide sufficient slack for the return tape to allow it to be readily unhooked.

The return tape is installed in the opposite order.

TABULATING TAPE

The tabulating tape, which is 21 13/16" long, is hooked from a pocket in the spring barrel passing over guide pulley Y then over take up pulley Z and hooked to stud in right end of return slide U.

TO REMOVE TABULATING TAPE

Caution: The tension of the spring is applied to the carriage in the usual manner.

To avoid damaging or tangling the tape, the following precautions should be observed:

There are two conditions under which the tape can be safely unhooked.

First: To let out the tension, this however, will destroy the previous tension adjustment.

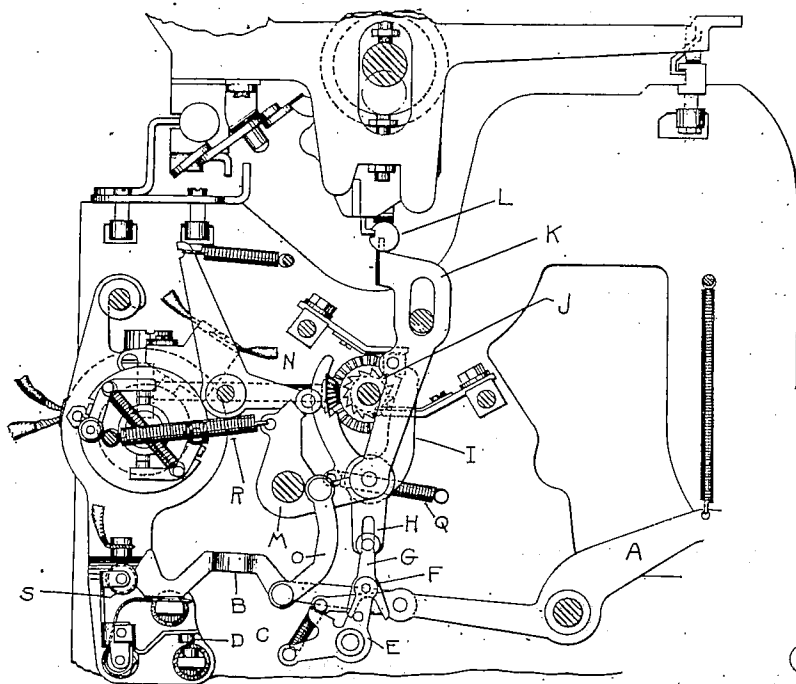
Second: Locking the clutch by depressing the carriage return key.

The carriage is first moved to locate the pocket of the spring barrel in the center, then the carriage return key is depressed which locks the spring barrel and holds the tension of the barrel spring.

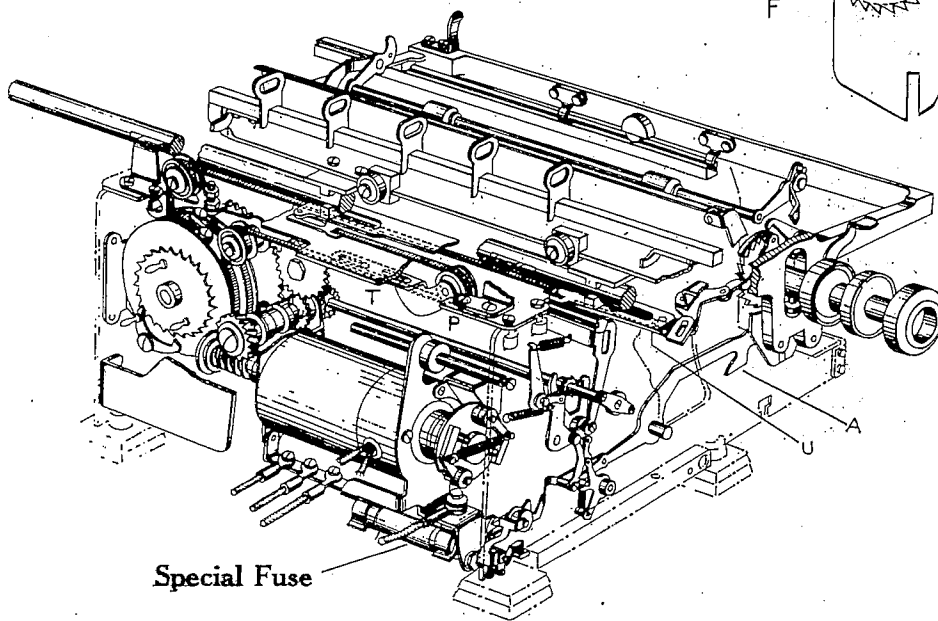
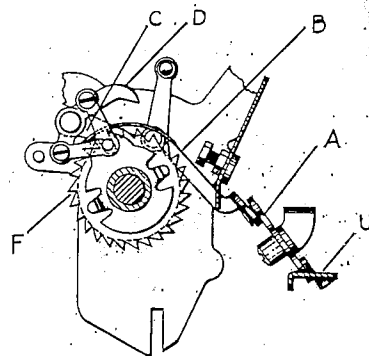
The tabulating tape is now slipped over guide pulleys Y and Z, which permits ready removal of the tape. The tabulating tape is installed in opposite order.

# Shift Key Mechanism

Type 60 Machines



## Spacing Mechanism



BURROUGHS TYPE 60 MACHINE

SHIFT KEY MECHANISM

When the shift key A is depressed, lever B is rocked which lowers spear point of B to allow roller S to follow and points D to come together to operate the motor.

Spring C swings timing arm E, stud F moves from the front to the rear fork of bell-crank G, stud H contacting and rocking the forward front pawl of fork I to engage rotating ratchet gear J which raises arm K and the shift assembly upwards.

Cam point of bell-crank M rocks rearward and detent N seats over its forward surface. Link O raises spear point of link B which separates points D to stop the motor.

When the shift key is released, link B moves slightly upward which allows points D to come together and operate the motor. Timing arm E swings back, stud F moving over to and contacting on the front fork of bell-crank G which rocks the rear pawl of fork I to engage rotating ratchet gear which pulls downward arm K, rocks bell-crank M to normal, detent N seating on the rear surface. Link O lowers link B which allows roller S to restore and points D to separate which stops the motor.

Ratchet gear J is carried by shaft P which is rotated by beveled gears T from the clutch shaft. This is shown on the Return Key Mechanism print.

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## BURROUGHS TYPE 60 MACHINE

SHIFT KEY MECHANISM  
Tests and Adjustments

The motor must be running before pawl fork I engages ratchet gear J.

Test: Points D should contact when stud F (in timing arm E) is in the center of the fork of bell-crank G.

Adjustment: The arm which carries roller C is bent.

The front and rear pawls of fork I should seat in the ratchet teeth when the shift key is depressed which (motor cord off) is indicated by clearance between timing arm E and the stud in key lever A. Clearance between E and the stud in A can be observed by spring C being expanded.

Adjustment: The stud in key lever is tilted by bending rear arm of A.

Purpose of spring Q is to hold the pawls of fork I from ratchet gear J. When the machine is normal, spring Q pulls fork pawl I toward the front. When the shift key is held depressed, spring Q pulls fork pawl toward the rear.

Adjustment: The direction of the tension of spring Q is adjusted by tilting its spring anchor up or down.

Test to insure complete platen lift.

With motor cord disconnected, shift key held depressed, motor is twirled manually.

Platen should be completely raised when detent N passes over the spear point of bell-crank M. This same test is applied when the shift key is allowed to return, then the platen should also be completely lowered when detent N passes over the point of bell-crank M.

Adjustment: The position of detent N can be equalized for both positions by turning eccentric R.

BURROUGHS TYPE 60 MACHINE

SPACING

Return slide U rocks bell-crank A which through link B rocks space arm C. Pawl D glides over part E and engages ratchet F and turns the platen one or more spaces.

The spacing movement of return slide U is controlled to prevent double spacing by the air dashpot which is fastened to the outer carriage. The plunger of the dashpot is connected to return slide U.

TESTS AND ADJUSTMENTS

The movement of pawl D is limited by adjusting screw E and nut F.

Screw E should be adjusted to block further movement of pawl D when the detent is seated in the ratchet tooth.

Bell-crank A must move very freely when the shift key is normal or when it is held depressed.

Adjustment: Bell-crank A is aligned with link B.

Note: The platen in electric typewriters is fastened to the platen shaft at both ends.

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## BURROUGHS TYPE 60 MACHINE

MOTOR UNIT

The motor unit which includes switch assembly for shift key, condenser and fuse can be readily removed. This assembly hangs on a shaft which passes through collars in the side plates of the motor.

Lower projections on the motor side plates are fastened to the key lever guide bar. The motor unit can be readily removed by loosening the screws in the collars of the side plates and the screw in the collar of the overthrow limit and the two lower screws in the guide bar.

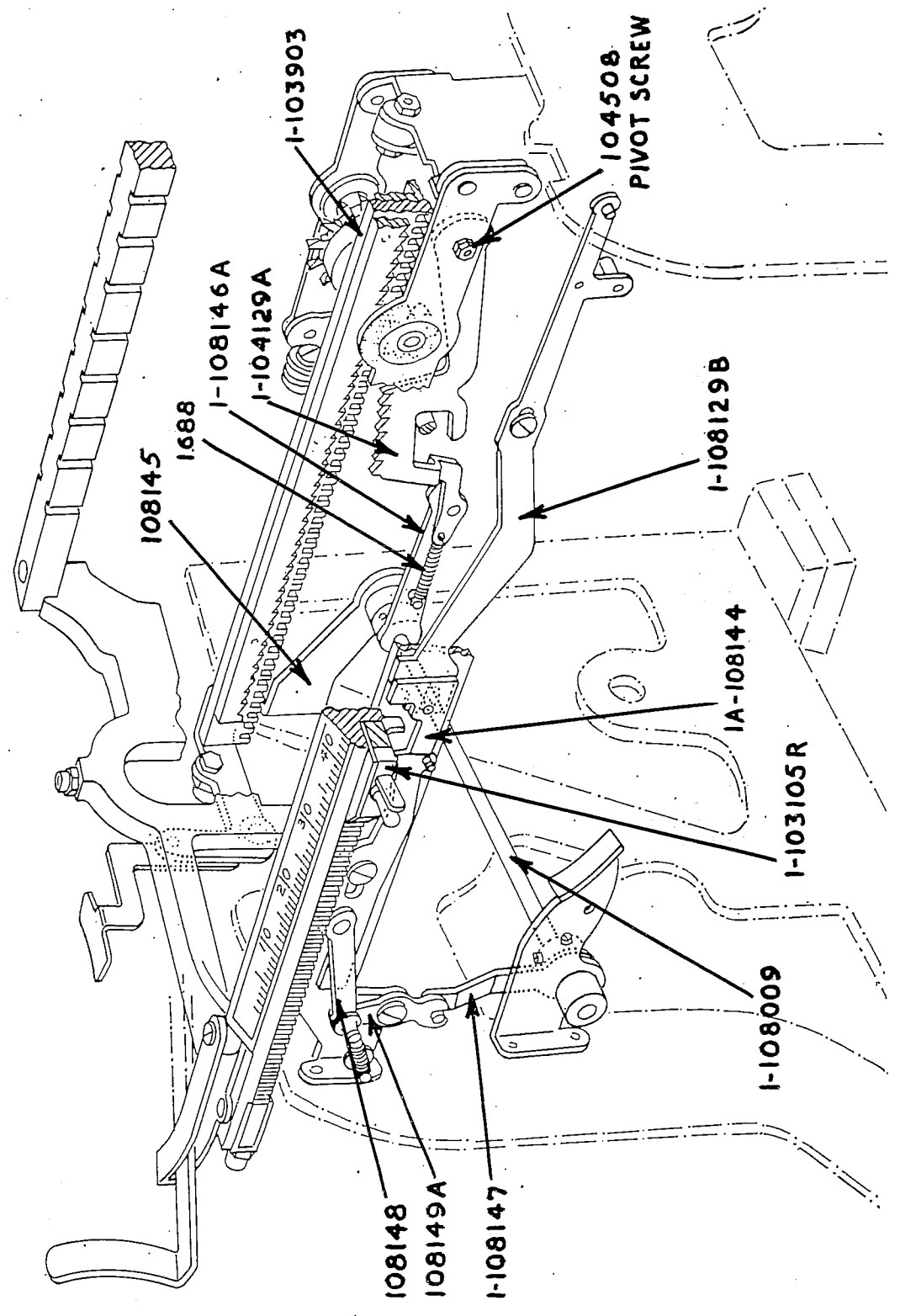
The motor is protected by a special fuse and thermal cut out, its purpose is to prevent the motor burning out in the event that the return tape were to break which would wind the spring tight and stop the motor, or the carriage is held by the operator.

This special fuse will not blow in less than twenty to thirty seconds. An ordinary fuse must not be used under any circumstances.

MOTOR SPEED

The motor speed is set to turn shift ratchet shaft 185 to 190 R.P.M. The speed of shaft P can be tested by slightly depressing the shift key and holding a screw driver on gear T of shaft P and counting the number of times the screw in the gear strikes the screw driver.

# AUXILIARY MARGIN LIMIT MECHANISM



## BURROUGHS TYPE 60 MACHINE

AUXILIARY MARGIN LIMIT MECHANISM

The purpose of this mechanism is to prevent a possible overthrow of the carriage when the latter is returned with undue force.

This mechanism locks the escapement rack as the carriage limits on the margin block.

All Type 60 machines of any pitch are equipped with this mechanism.

Type 50 machines of 12 pitch construction which are now being built at the Factory, are equipped with this mechanism. Also all machines of other than 12 pitch having thirteen inch or larger carriages are equipped with this mechanism.

This mechanism cannot be installed by inspectors in the Field and for that reason it will not be supplied on Service Station part orders.

SEQUENCE AND CONSTRUCTION

When the carriage is moved toward the right, margin block 1-103105R first contacts on 1A-168144 which raises part 1-104129A, meshing it with and locking escapement rack 103903 as margin block 1-103105R contacts on margin release lever 1-108129B through link 108149A bell-crank 1-108147, shaft assembly 1-108009 and bell-crank 1-108146.

Part 1-104129A which swings on shoulder screw 104508 has an elongated slot in order to allow the teeth of part 1-104129A to readily enter the tooth spaces of rack 103903 under all conditions.

Part 1-104129A is held to the right end of its slot by spring 1688.

TESTS AND ADJUSTMENTS

One of the screws in hub of arm 1-108147 should be loose and the other screw should be sufficiently tight to retain the position of part 1-104129A.

With the middle finger of the left hand under arm 1-108146A and the thumb against the platen twirler, part 1A-168144 is located so that its edge is in line with the edge of margin release lever 1-108129B. The loose screw in arm 1-108147 is tightened and the other screw is also tightened.

Note: Before adjusting this mechanism, the escapement mechanism should meet the tests outlined on Pages 4 and 5 of the Typewriter Instruction Book.

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