28 AND 35 MULTIMAGNET NONTYPING REPERFORATOR

DESCRIPTION AND PRINCIPLES OF OPERATION

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1. GENERAL

1.01 The multimagnet nontyping reperforator unit is an electromechanical device, used for reproducing perforated message tape in response to code impulses received on multiwire signal paths from an external source. It is available in two variations: The fully perforated tape unit and the chadless tape unit.

1.02 Unless stated to the contrary, references in the text to "left" or "right" indicate the operator's left or right, facing the front of the set — the selector mechanism at the right and the punch mechanism at the left. In illustrations, unless specifically labeled otherwise, it is assumed that the equipment is being viewed from the front. Pivot points are shown in the drawings by circles or elipses which are solid black to indicate fixed points and crosshatched to indicate floating points.

2. DESCRIPTION

GENERAL

2.01 The reperforator is designed to operate at speeds up to 200 words per minute (1200 operations). Its design permits 5, 6, 7, and 8-level code operation.

2.02 The reperforator employs the fully automatic code selection system employing multiwire paths. This method of operation has the advantage of higher speeds over the sequential mode of operation using a single magnet selector.

2.03 The reperforator incorporates the electrical and mechanical features necessary to perform the following functions:

(a) Receive communication codes on multiwire paths and convert them into mechanical motion.

(b) Convert the selected mechanical motion of the multimagnet code selector into the desired perforation on tape.

(c) Perforate and feed tape in timed relation to a distributor.

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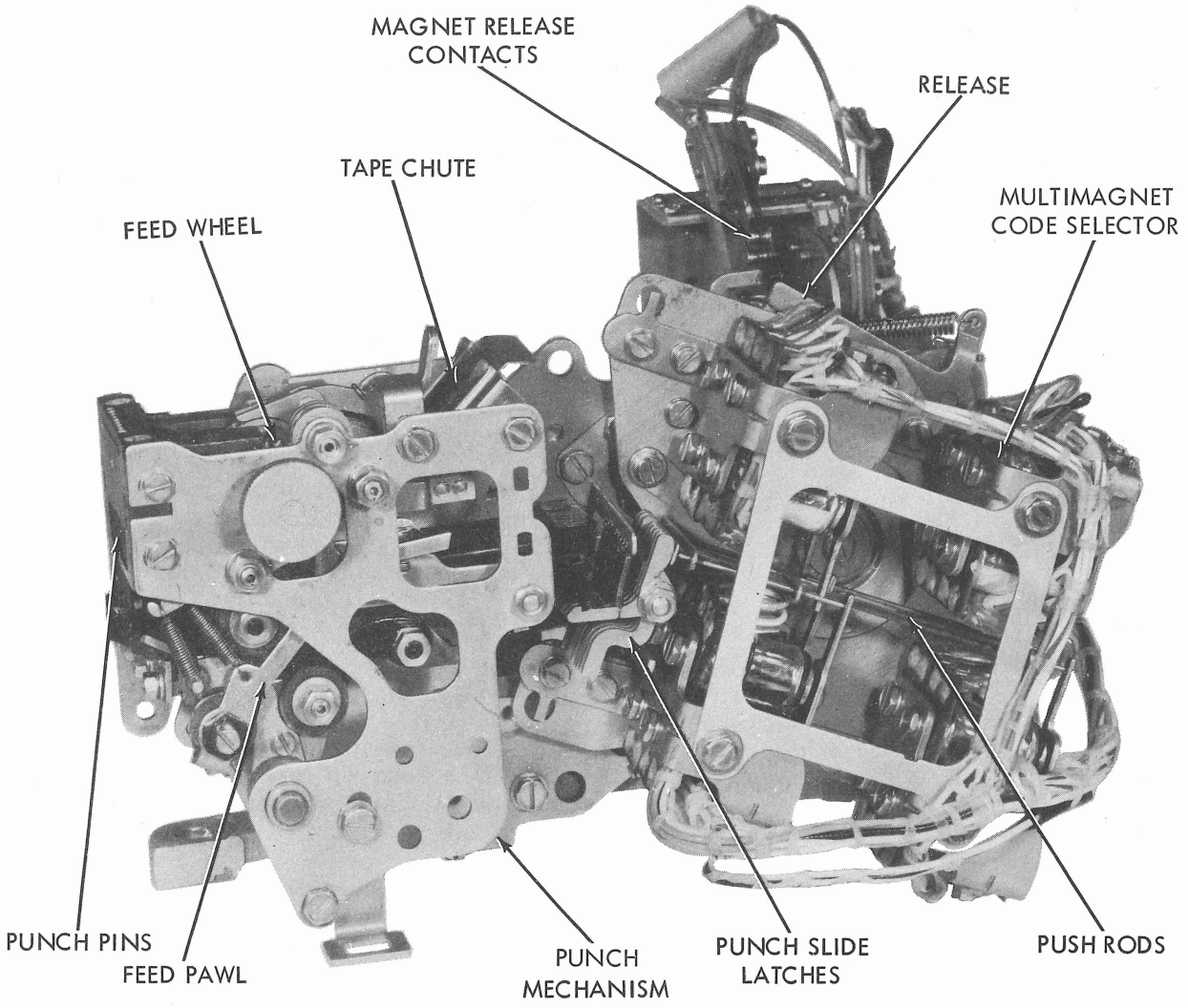

Figure 1 - Parallel Input Reperforator

SELECTING MECHANISM

2.04 The selecting mechanism is a transducer which converts electrical pulses into mechanical motion. The code magnets receive the incoming pulses and through mechanical means activate the applicable punch pins for perforating the tape.

FUNCTION MECHANISM

2.05 The function mechanism releases the punch slide and sets it in position under its respective punch pin. The punch slides, associated with code magnets which were not energized, remain in the unselected position.

PUNCH MECHANISM

2.06 During the operation of the function mechanism, the punch mechanism applies vertical motion to a punch slide post and horizontal motion to a punch slide reset bail. The selected punches are then forced through the tape.

VARIABLE FEATURES

2.07 A variety of optional features are available with the equipment. These features, which provide special operations or control facilities, or which serve as an aid in operation,

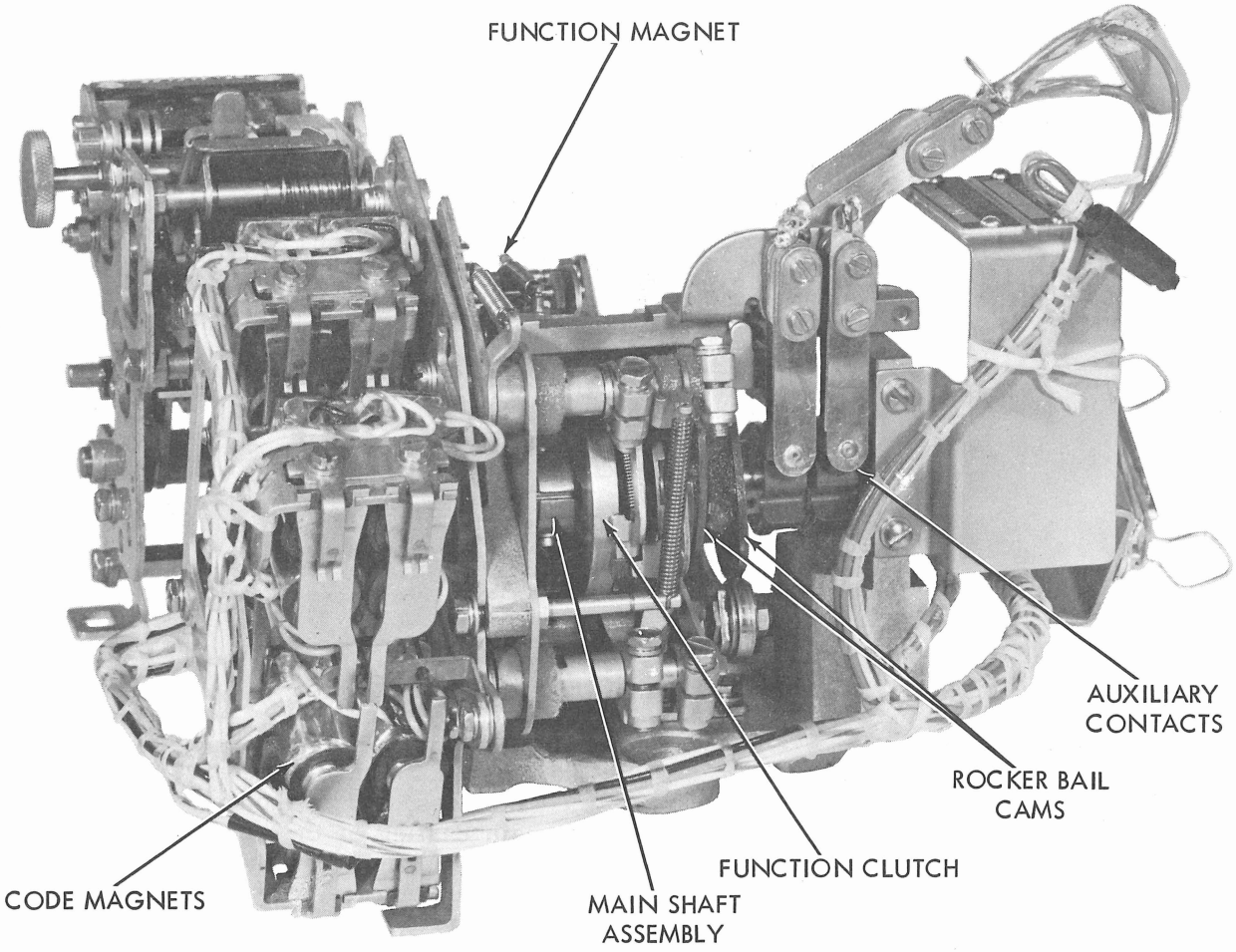

Figure 2 - Parallel Input Reperforator

are in most cases readily installed in the field. Some of these features are described briefly below.

(a) Tape Feed-Out Mechanism - The function of the tape feed-out mechanism is to automatically feed out tape when the tape feed-out button is depressed. This is a convenience feature which makes it easier for the operator to handle the tape.

(b) Verifying Reader Mechanism - The general function of the verifying reader is to read the tape as it leaves the reperforator. The reader is capable of 1200 operations per minute. The verifier uses the same driving mechanism that the punch uses.

(c) Auxiliary Contacts - The contacts are operated only during a function cycle for a variety of external control functions. The contacts are adjustable for 40 per cent make and 60 per cent break.

3. TECHNICAL DATA

APPROXIMATE DIMENSIONS

Width	15-1/2 inches
Depth	10-7/8 inches
Height	9-3/4 inches
Weight	24 pounds

SIGNAL

Code	Multiwire, 5-, 6-, 7-, and 8-level
Current	0.065 ampere

TAPE

Type	Standard communications
Width (5-level)	11/16-inch
Width (6 and 7-level)	7/8-inch
Width (8-level)	1-inch
Perforations 5-level	Chadless
(5- to 8-level)	Fully perforated
Perforation spacing	10 holes/inch
Feed holes and code holes	In line

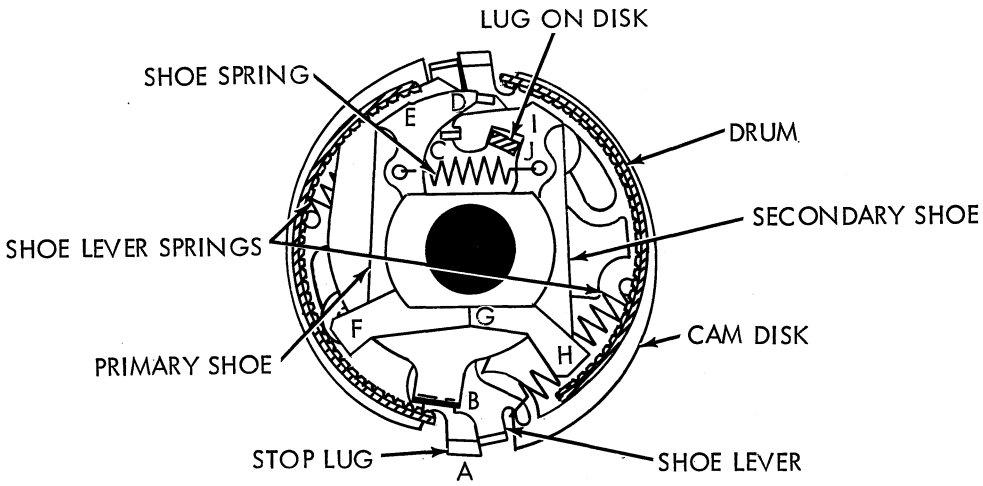

Figure 3 - Clutch Disengaged

4. PRINCIPLES OF OPERATION

GENERAL

4.01 The reperforator is used to provide a means of reproducing perforated tape in systems employing multiwire (parallel) code level paths.

4.02 Each element of the code is applied to an individual magnet. Each code magnet and the function magnet are connected to a distributor by individual circuits. The code magnet selector armatures are insured against failure to retract to the rest position by a power retraction bail.

4.03 The current requirement for the selector code magnet is 0.065 ampere and 0.100 ampere for the function magnet.

REPERFORATOR UNIT

A. General

4.04 The reperforator unit consists essentially of a main shaft, a bank of code magnets, a punch mechanism, and a function mechanism.

4.05 The main shaft rotates on two bearing surfaces, and is mounted horizontally on the main casting of the reperforator unit (see Figure 2). Mounted on the main shaft are the function clutch reset cams, rocker bail cams and auxiliary cams.

4.06 When the clutch on the main shaft is tripped, it drives the function mechanism through one cycle of operation and immediately disengages.

4.07 Figure 3 shows a typical two-stop clutch disengaged. Disengagement occurs when lug B on the shoe lever and the cam disk stop lug A are brought close together. The shoe lever pivots clockwise about its ear C, which is located in a notch in the upper portion of the secondary shoe. Shoe lever ear D is moved to the right. The shoe springs contract and pull the two clutch shoes toward each other and away from the serrated drum surface. The drum continues to rotate, but the mechanism attached to the cam disk does not.

4.08 Figure 4 shows the same clutch engaged. Engagement occurs when the cam disk and lug B on the shoe lever are released. The shoe lever spring immediately contracts. The shoe lever pivots counterclockwise about the shoe lever ear C, under the influence of the shoe lever spring. It overcomes the tension

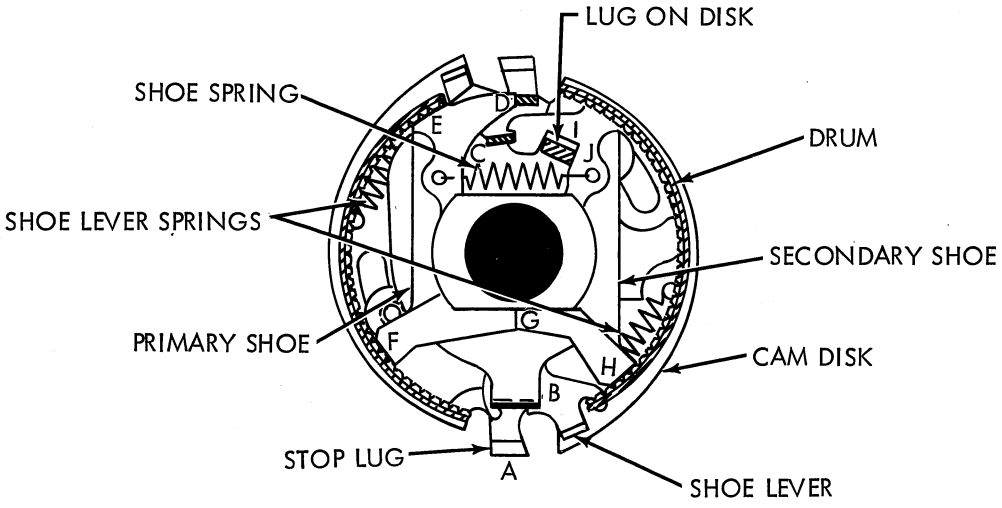

Figure 4 - Clutch Engaged

of the shoe springs and moves the shoe lever ear D to the left. This forces the primary shoe against the serrated drum surface at point E. The counterclockwise rotation of the drum drives the primary shoe downward and so makes further contact with the drum at point F. The movement of the primary shoe in direction of the drum is transferred to the secondary shoe at point G, which causes the secondary shoe to bear against the drum at H. The revolving drum drives the secondary shoe upward to make contact with the drum at point I as well as H. A force component is developed at I in a horizontal direction, but is transferred to lug J on the clutch adjusting cam disk, which causes the cam disk to rotate with the drum. The associated mechanism attached to the cam disk then rotates with the drum.

4.09 The cam assembly is attached to the clutch cam disk, and consists of two rocker bail cams and a reset disk (Figure 2). The cams and reset disk perform their function in 180 degrees of rotation and are coordinated with the two stop positions of the clutch. The rocker bail cam actuates the rocker bail from which motion is extended to the perforator. The reset disk is fitted with two pins, which in 180 degrees of rotation, initiates resetting action for the function mechanism.

B. Selecting Mechanism

4.10 The selecting mechanism consists of a code magnet, a push rod, a punch slide latch, and a punch slide for each code level of operation (Figure 5). The code magnet is energized by an incoming pulse from a distributor. The code pulse energizes its respective code magnet causing the armature to be attracted to the magnet core. As the armature moves toward the magnet, it pushes against the push rod, which in turn moves the punch slide latch. The punch slide latch is held in an unlatched position allowing the selected punch slide to move to the left. A power retraction bail insures the return of the armature.

C. Function Mechanism

4.11 When the function magnet is energized by a pulse from the distributor, its armature releases the function trip lever, which is clamped to a function trip shaft. The function trip lever is drawn up toward the magnet by its spring and causes a lower trip lever on the opposite end of the function trip shaft to activate the main trip lever (see Figure 6). The forked end of the main trip lever moves downward, depressing the punch slide reset bail. Depression of the punch slide reset bail permits any punch slide that has been unlatched (due to energizing of its associated code magnet by a code impulse) to move to the left under its respective punch pin. The punch slides, associated with code magnets which were not energized, remain in the unselected position.

4.12 As the main trip lever moves to the left, it trips a release which is attached to the clutch trip shaft. Tension exerted by the release spring causes a clutch trip lever, which

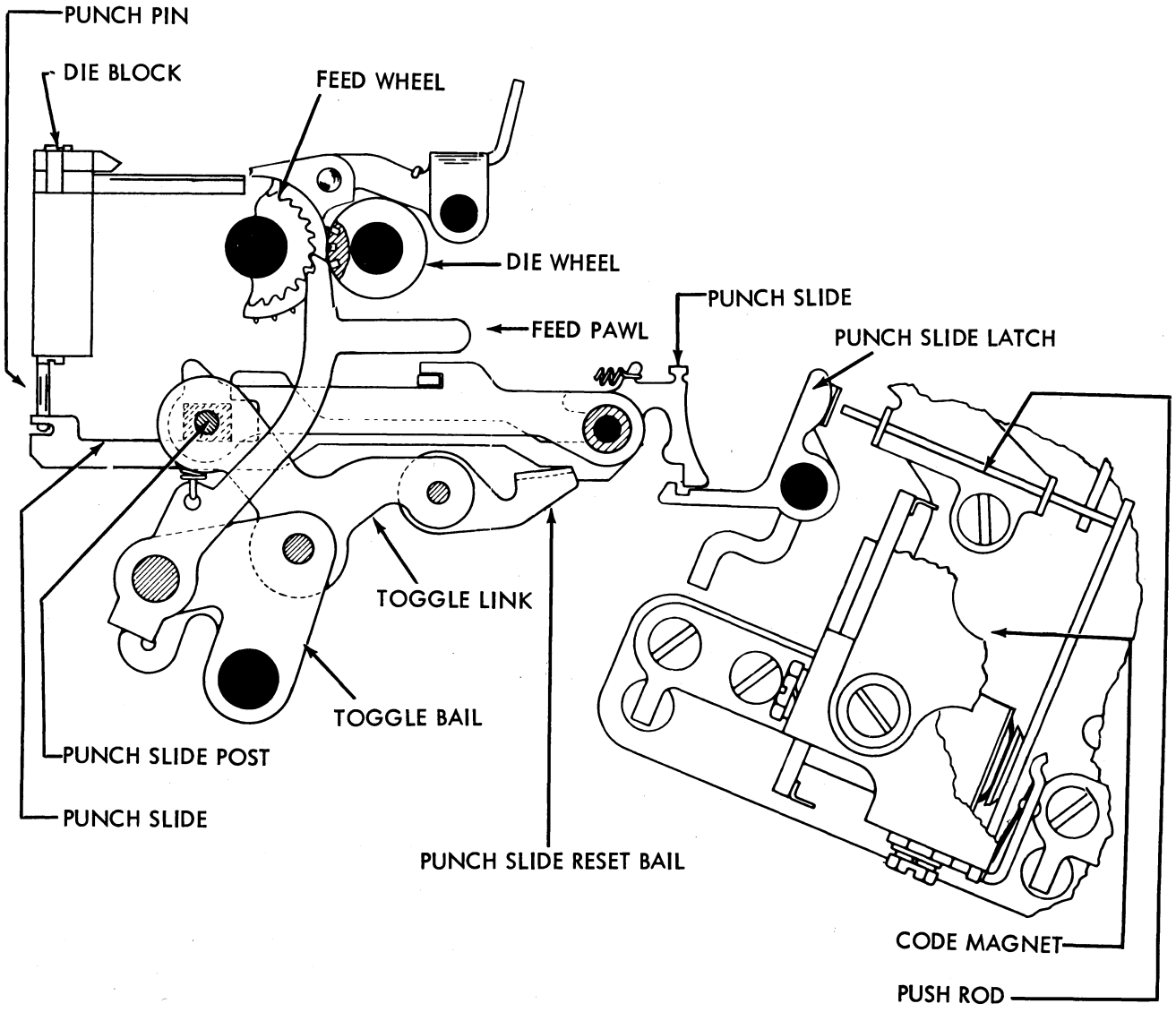

Figure 5 - Selecting Mechanism

is clamped to the midportion of the shaft, to release the clutch. A lower reset arm is clamped to the midportion of the function trip shaft. A trip lever reset cam is clamped to the inner end of the clutch trip shaft. As the cam assembly rotates, a pin on the reset disk depresses the lower reset lever to reset the function trip lever on the function magnet armature. Immediately following, another pin (diametrically opposite on the reset disk) raises the release sufficiently to permit the release to reset on the main trip lever. A clutch latchlever is suspended freely on the clutch trip shaft. Its spring causes it to ride the clutch cam disk. The contour of the cam disk is such as to permit the latch to engage a shoulder on the disk at the point of clutch disengagement.

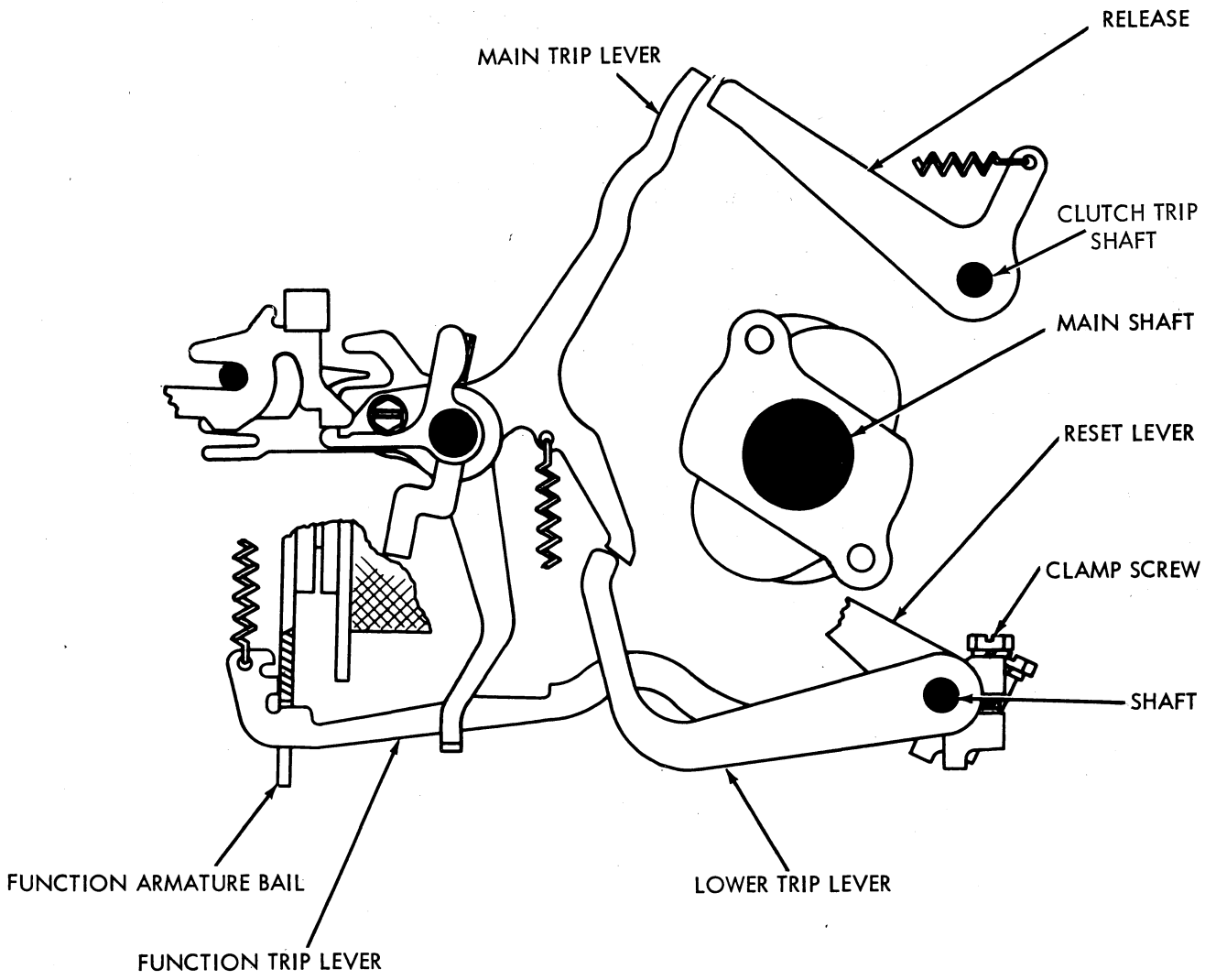

Figure 6 - Function Mechanism

Note: When rotating the motor by hand, the clutch will not fully disengage upon reaching the stop position. It will be necessary therefore to apply pressure to the cam disk in the direction of rotation to permit the latchlever to seat and secure full disengagement. This will also be true on starting the motor under power, if the clutch has been tripped during the off period. When the motor is operating under power, the momentum of the rotating clutch insures full disengagement.

D. Punch Mechanism

4.13 Action of the rocker bail during rotation causes the rocker bail to apply longitudinal motion to a drive link (Figure 7). The drive link connects with a rocker arm, which is clamped to a toggle bail shaft in the perforating assembly. As the toggle bail rocks, toggle links attached to the front and rear of the bail apply vertical motion to a punch slide post, and horizontal motion to a punch slide reset bail. At the start of the perforating cycle, the punch slide reset bail withdraws from the shoulders on the punch slides and permits any slides that have been selected in response to code impulses to extend over the top of the punch slide post. These selected slides are carried upward by the post to force the punch pins through the tape. Unselected punch slides are retained in the unselected position by their latches and do not engage the post. Toward the end of the perforating cycle, the punch slide post returns to its lower position. The punch slide reset bail restores the punch slides to the unselected

position and retains them there against the tension of their springs.

E. Tape Feeding

4.14 As the tape emerges from the tape guide, it passes between a feed wheel and a die wheel. A tape shoe holds the tape in contact with the feed wheel from where it passes into the die block for code perforation. A feed pawl attached to the toggle bail acts upon a ratchet wheel at one end of the feed wheel shaft and advances the tape subsequent to the perforation of each code combination. A detent (with roller) attached to the outer assembly plate rides the ratchet wheel and insures uniform spacing of the perforations.

F. Magnet Release Contacts

4.15 A magnet release contact is located on a bracket directly above the inner main shaft bearing. Its function is to break the circuit to the selector magnets and the function magnet immediately after the start of the function cycle. The contact break is caused by the action of a contact bail, which rides a rocker bail cam. Some units have the magnet release contacts strapped out and are electrically inoperative, even though the contacts are installed, wired, and adjusted.

G. Verifying Reader

4.16 The verifying reader senses the tape as it leaves the reperforator. The verifier mechanism contains five sensing pins that "read" the tape. Each of the pins closes a contact in response to a perforation in the tape. The sensing pins are synchronized with the perforator so that they are retracted during the tape feed portion of the perforator cycle.

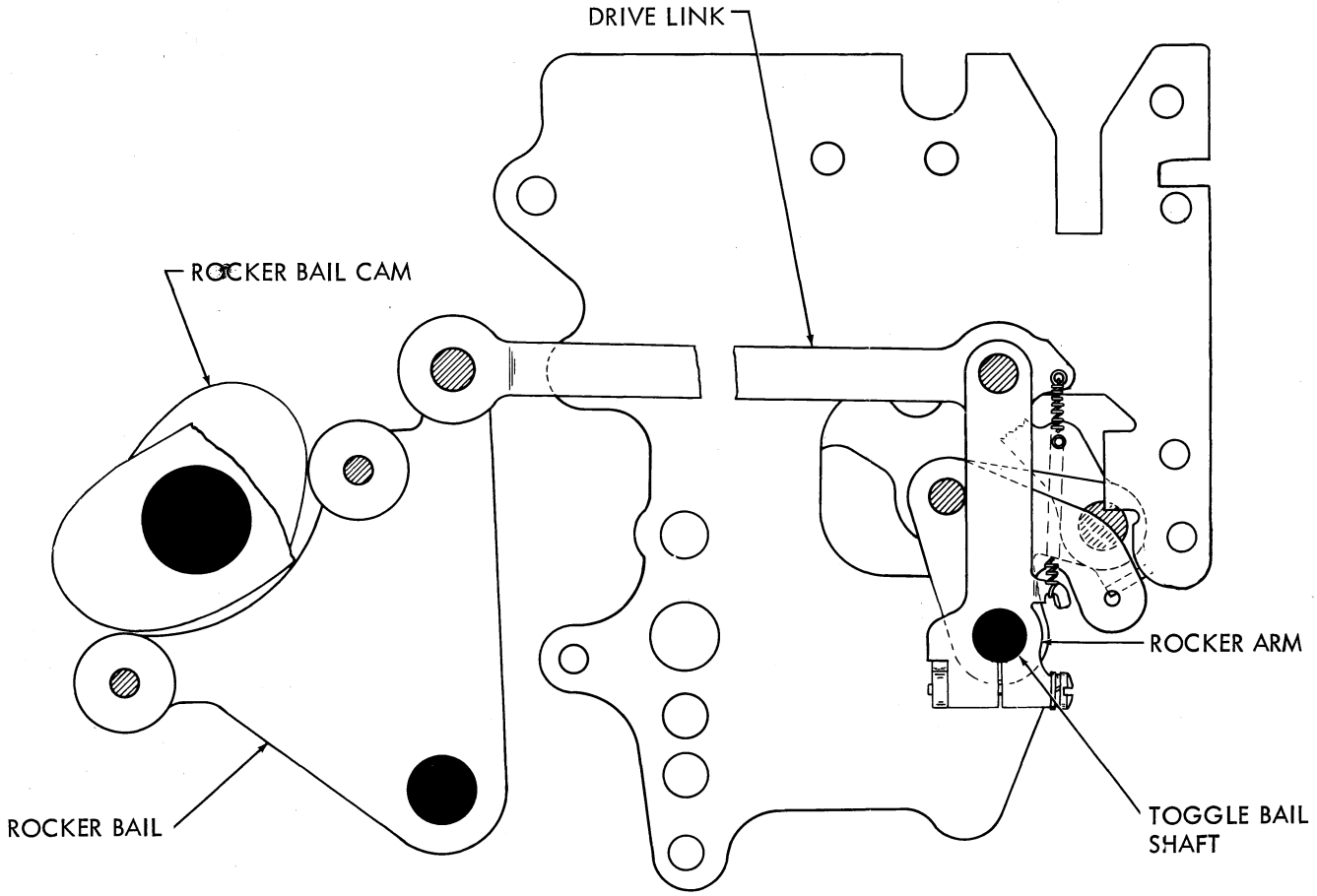

Figure 7 - Rocker Bail Connections