BELL SYSTEM PRACTICES
Teletypewriter and Manual Telegraph Station and P.B.X. Installation and Maintenance

SECTION P32.002
Issue 1, September, 1948
AT&T Co Standard

LINE-TEST KEY (CAM TYPE) (SPECIAL 531 TYPE PER D-171304) REQUIREMENTS AND PROCEDURES

1. GENERAL

1.01 This section contains the apparatus requirements and adjusting procedures for the maintenance of the line test key; Special 531 type key per D-171304.

1.02 The following shall be observed in applying the requirements and procedures:

(a) Use appropriate gauges for dimensional measurements.

(b) The following special tools should be used for adjusting these keys:

KS-7782 Parallel Jaw Pliers.

(c) If a part that is mounted on shims or with separators is to be dismantled, the number of shims or separators used at each of its mounting screws should be noted so that the same pileups can be replaced when the part is remounted.

(d) After adjusting a part, check the adjustment of the related parts which may have been disturbed.

(e) Parts dismantled to facilitate checking or readjustment shall be assembled after operation is completed.

2. CLEANING

2.01 Remove dust and other dirt around contacts, between springs and in other parts of the key by brushing. Grease or grease-locked dirt should be removed with a toothpick wet with carbon tetrachloride taking care to keep the carbon tetrachloride from coming in contact with the rollers and insulators.

2.02 Clean contacts with a toothpick wet with carbon tetrachloride. Badly pitted contacts should be burnished with contact burnishing tool.

3. LUBRICATION

3.01 Bearing pins should be lubricated at very infrequent intervals, not more often than every two years.

(a) To lubricate apply one drop of oil at the point where the phosphor bronze bushing and the key frame meet. **Fig. 1**

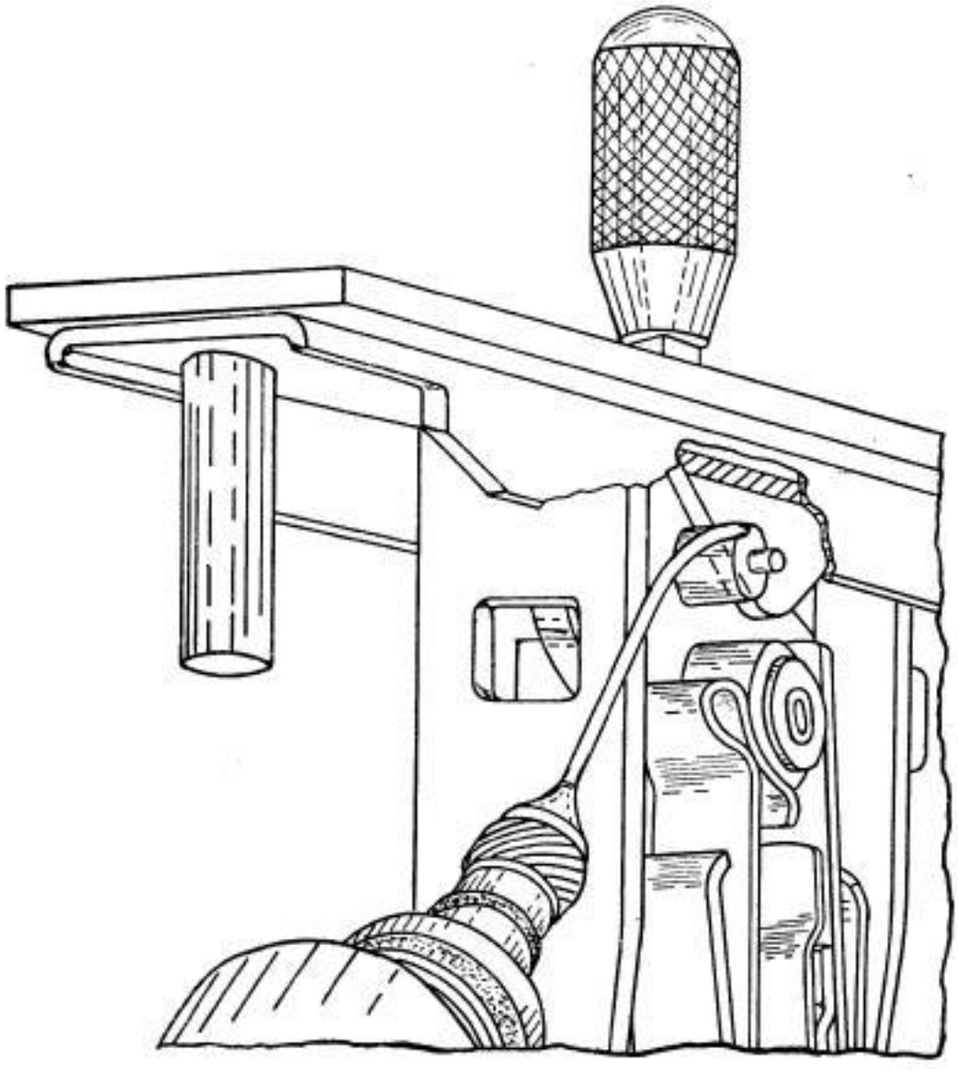


Fig. 1

4. REQUIREMENTS AND PROCEDURES

Note: Due to the design and method of mounting these keys it will not be practical to perform the adjustments specified herein unless the key is removed from its mounting bracket. To remove the key from the mounting bracket proceed as follows: Remove the lever handle and remove the key unit mounting screws after which the key unit can be withdrawn from the bracket.

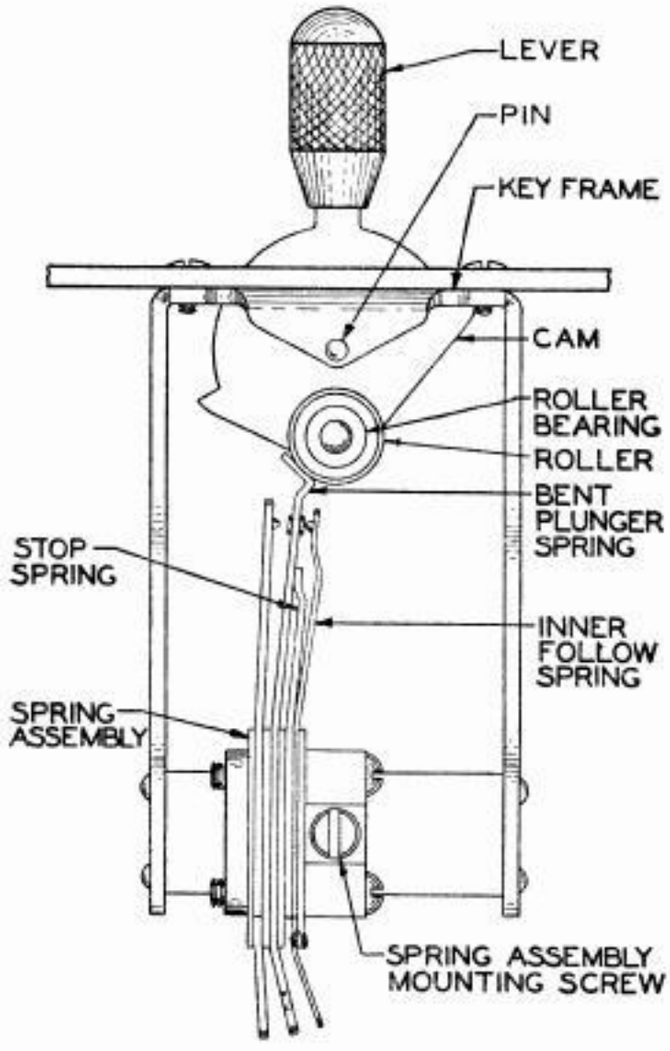


Fig. 2

4.01 **Rollers** shall turn freely on their bearings. When the lever is released slowly from the operated position, it shall return to the unoperated position by the pressure exerted by the springs. See Fig. 2 for location of parts. **Fig. 2**

(a) To adjust, free binds by cleaning, otherwise replace the key frame and cam assembly.

Note: To replace the key frame and cam assembly proceed as follows: Remove the spring assembly mounting screw. Remove the spring assemblies from the frame and mount them on the replacing frame. Insert the mounting screw and tighten securely. Check to see whether the key meets its requirements and if not, adjust as required.

4.02 The **pressure of the plunger springs** against the rollers shall be such that the lever will be held normal to the key base when in the unoperated position.

(a) To adjust loosen the spring assembly mounting screws and shift the spring assembly. Tighten spring assembly mounting screws securely. If the lever still fails to assume its correct position, adjust the pressure of the plunger springs against the rollers by very slightly bending the plunger spring or the stop springs.

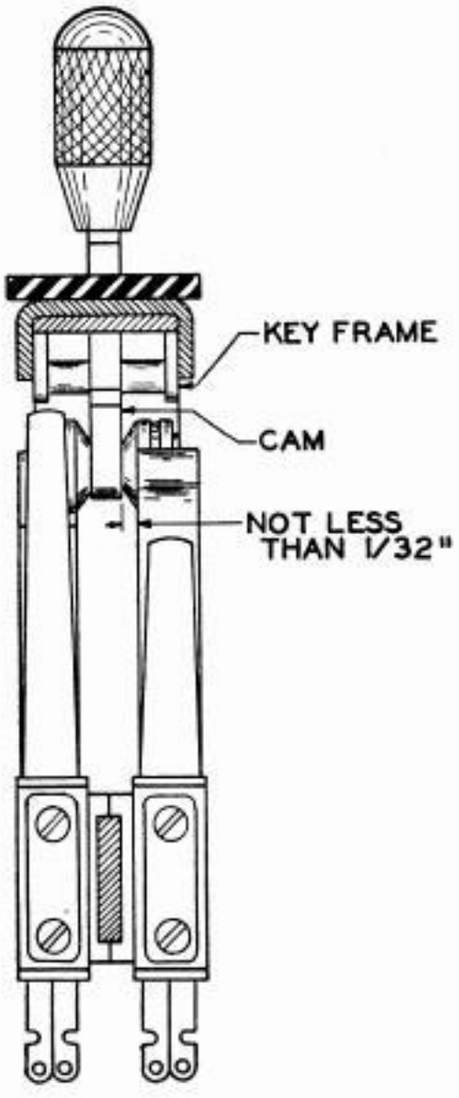


Fig. 3

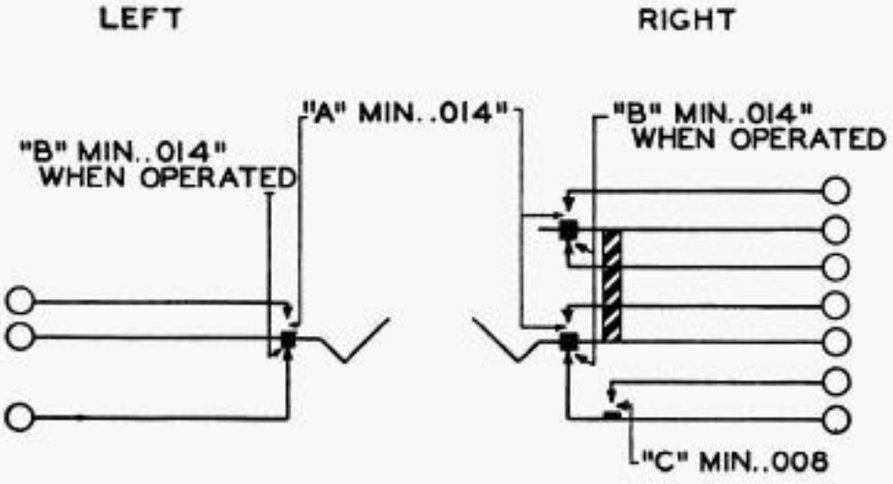
4.03 **Springs shall clear** the cam by not less than 1/32". Gauge by eye. **Fig. 3**

REQUIREMENT.
CONTACT ALIGNMENT

Fig. 4

4.04 **Contact shall line up** so that the point of contact falls wholly within the boundary of the opposing contact at all times during contact. Gauge by eye. **Fig. 4**

(a) To adjust, loosen the spring assembly mounting screws and shift the springs. After aligning the contacts and being sure that the springs are in correct relationship with the cam and key frame, tighten screws securely. Check 4.02.



UNOPERATED POSITION

Fig. 5

4.05 **Separation between contacts** marked A in Fig. 5 when the key is in the unoperated position, and the separation between contacts marked B in Fig. 5 when the key is in the operated position, shall be not less than .014". The separation between contacts marked C in Fig. 5 shall not be less than .008" when the key is in the unoperated position. **Fig. 5**

(a) To adjust, bend springs using KS-7782 parallel jaw pliers being careful not to kink or to make sharp bends in any of the springs. **Fig. 6**

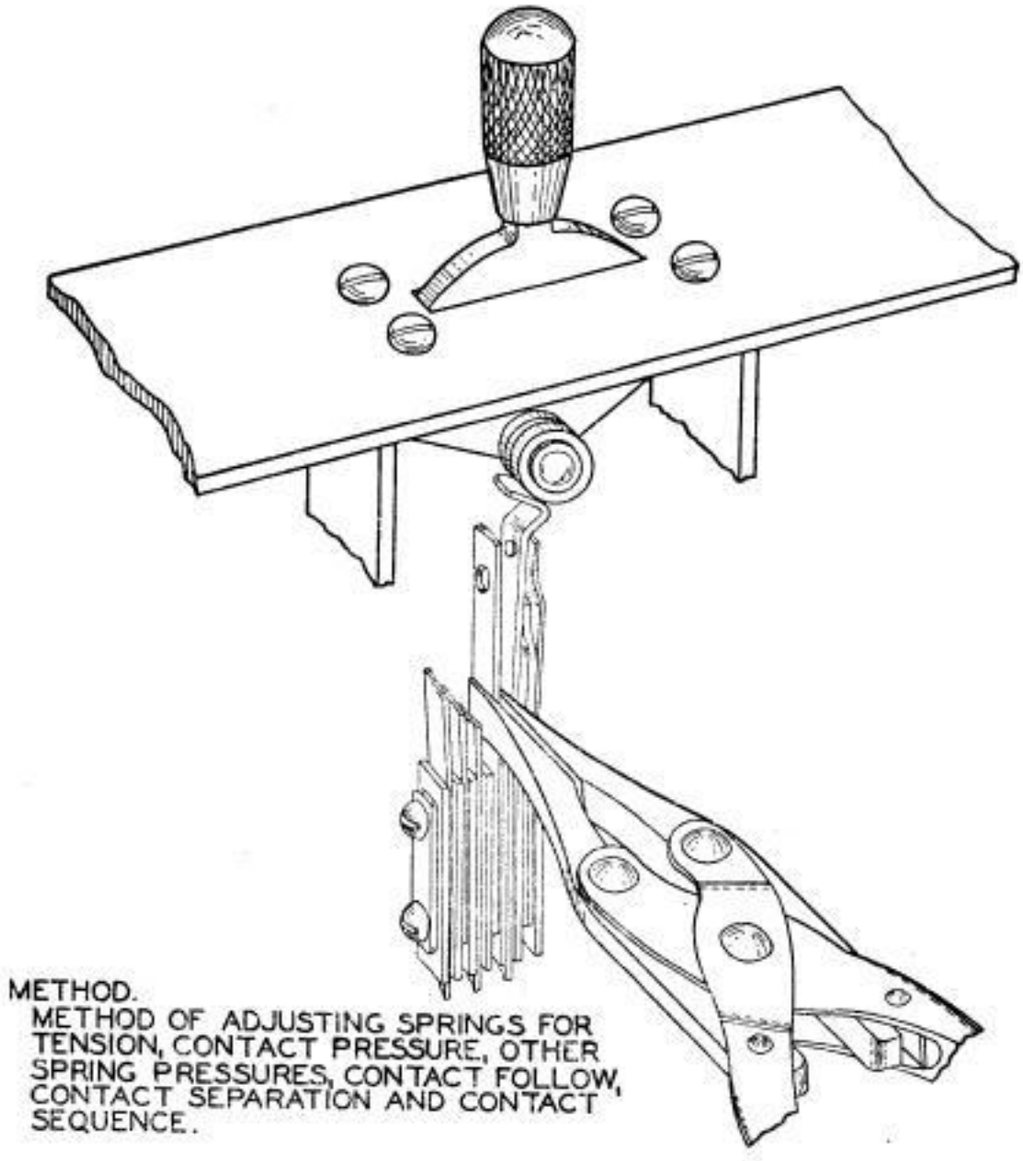


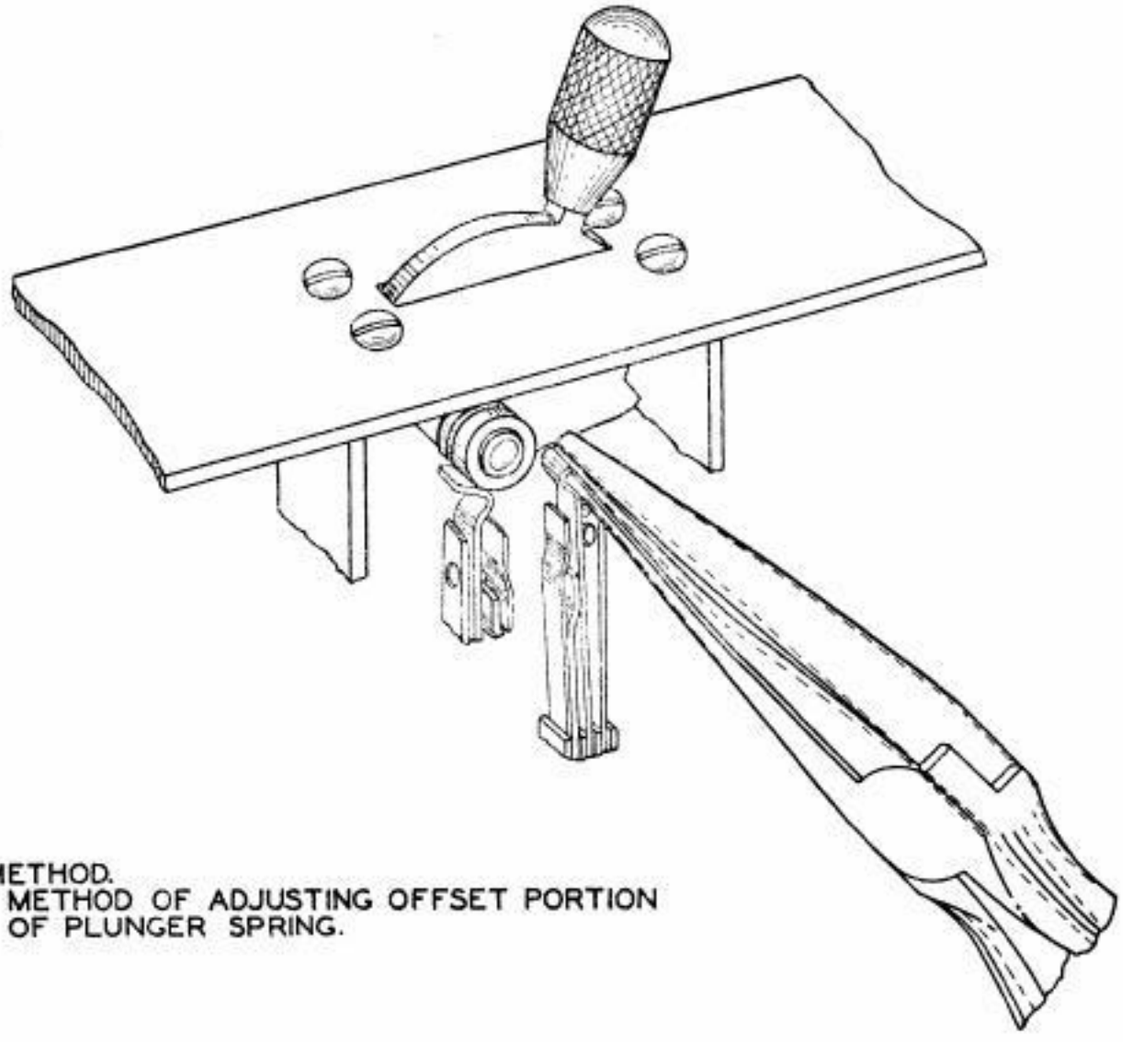
Fig. 6

4.06 The **contact pressure** between closed contacts shall be not less than 2 ozs. Measure at the top end of the contact springs.

(a) To adjust, bend springs being careful not to kink or make sharp bends in them.

4.07 **Contact sequence**—When the lever is moved from the unoperated to the operated position, the contact marked C of the right spring assembly shall close before either of the contacts marked B of the same spring assembly open. **Fig. 5**

(a) To adjust, connect an ohmmeter between the different contacts to determine the sequence of operation while moving the key lever slowly. Bend springs if necessary. **Fig. 6**



METHOD.
METHOD OF ADJUSTING OFFSET PORTION OF PLUNGER SPRING.

Fig. 7

4.08 Pressure not less than 2 ozs. shall be required to start the lever moving from the operated position toward the unoperated position. The end of the lever shall move not less than 1/4" before restoring to the normal position by the spring action.

(a) To adjust, bend the offset portion of the plunger springs very slightly using the KS-7782 parallel jaw pliers. **Fig. 7**