

RINGING MACHINES KS-5159, KS-5319, AND KS-5352 TYPES DESCRIPTION

1. GENERAL

- 1.01 Holtzer-Cabot QD-Type ringing machines per KS-5159-01, KS-5352 and KS-5319-01 are used with the 700 series PBX equipments, small dial central offices and similar small power plants.
- 1.02 This section is reissued to add the wiring diagram for the KS-5319-01 machine and a description of the various busy tone and ringing current interrupters.
- 1.03 The QD-Type ringing machines consist of a two bearing bi-polar inverted rotary converter, a "step-up" transformer, tone commutator and interrupters, arranged to furnish alternating and interrupted direct current for ringing and tone respectively. The armature has the usual commutator on the d-c. end and slip rings on the a-c. end.

In addition there is a high speed tone commutator on the a-c. end and a worm-gear driven interrupter on the d-c. end.

2. OUTPUT

- 2.01 An output of .25 ampere alternating current within the voltage limits noted below and at unity power factor, measured at the secondary terminals of the transformer is considered as full load on the machine. The machines normally operate from a 48 volt battery at an average speed of 1200 r.p.m. The machines are capable of delivering their full load output either intermittently or continuously.

Machine	D-C. Supply (Volts)	A-C. Volts
KS-5159-01	44-50	60-90
KS-5352	45-52	60-90
KS-5319-01	45-50	64-80

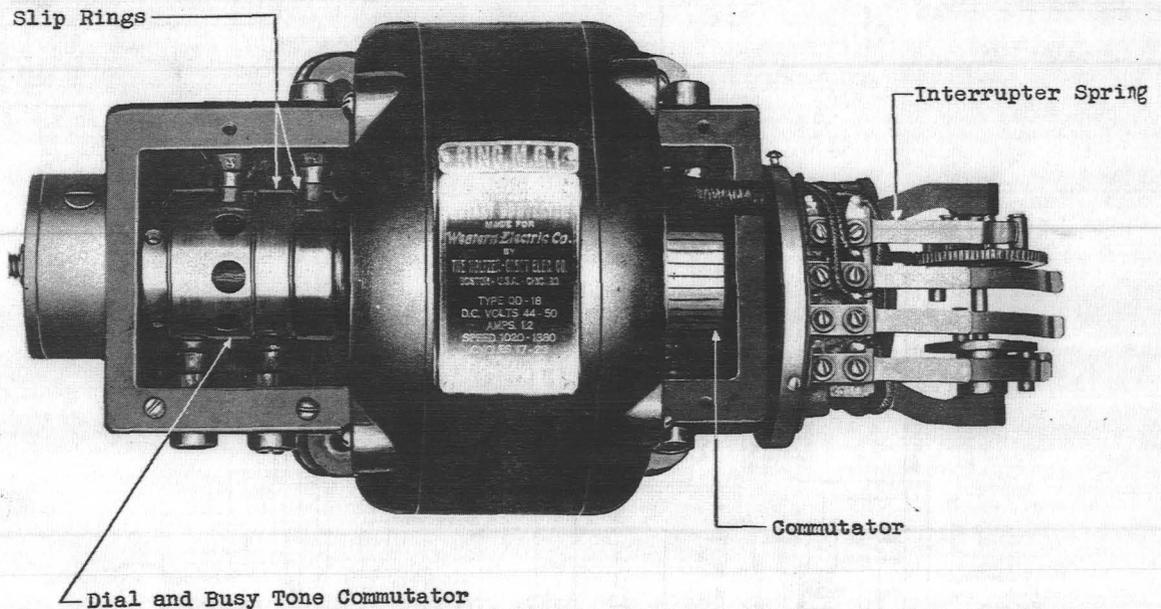
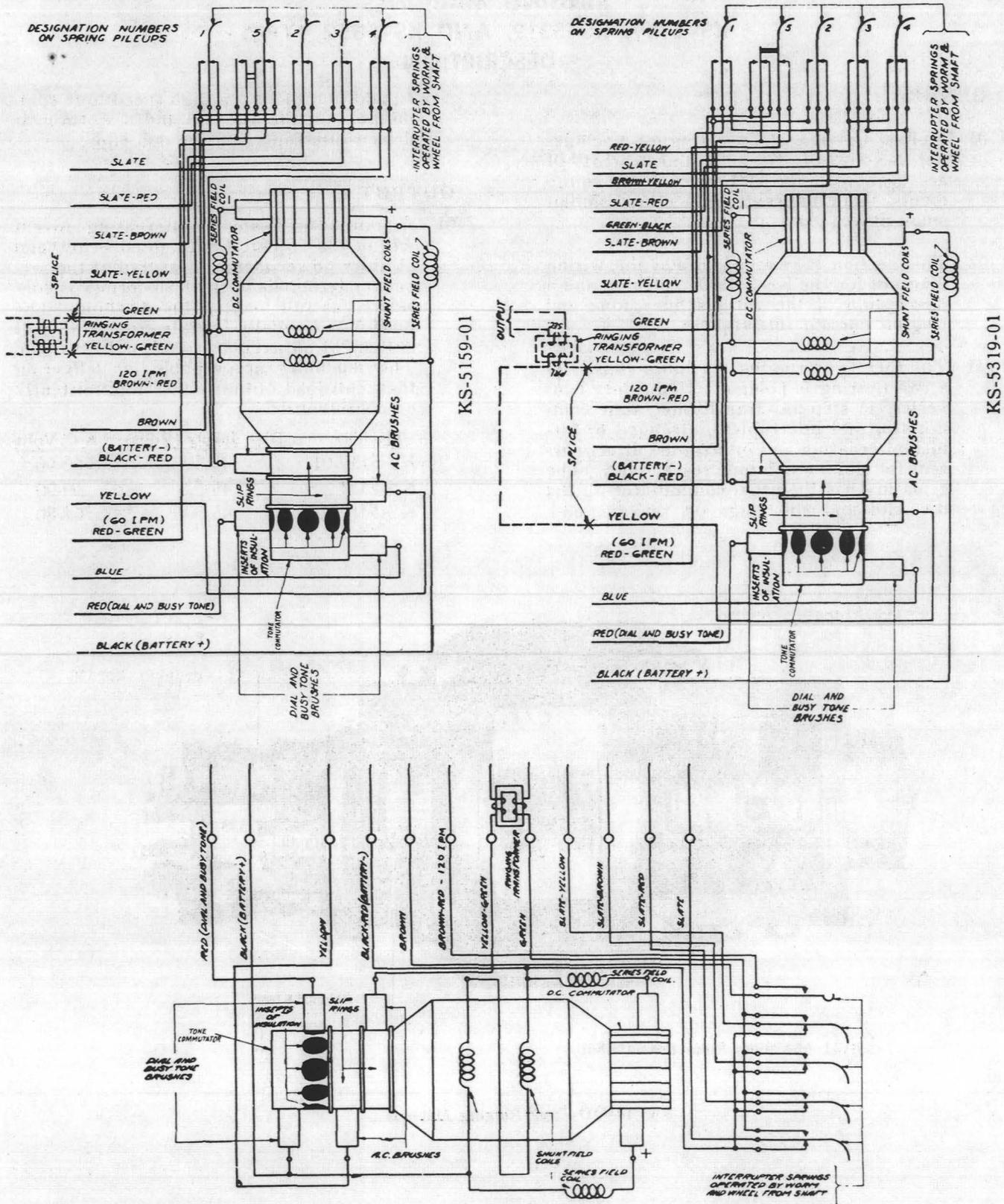


Fig. 1—QD-Type Ringing Machine



KS-5352
Fig. 2—Wiring Diagrams

3. DESCRIPTION

Busy Tone Interrupters (See Figs. 3 and 4)

- 3.01 The KS-5159-01 and KS-5319-01 machines are provided with a set of interrupters which interrupt the dial tone current nominally 60 and 120 times per minute on two independent circuits. The KS-5352 machine is provided with an interrupter which interrupts the dial tone current nominally 120 times per minute to give a busy tone.

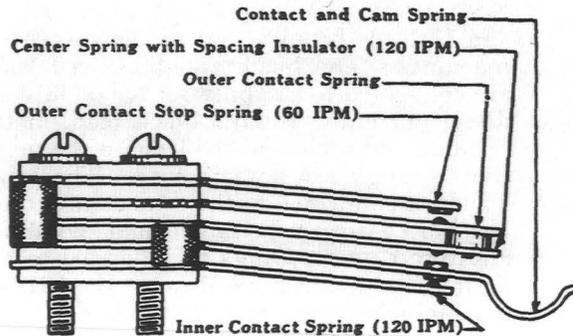


Fig. 3—Busy Tone Interrupter Springs KS-5159-01

- 3.02 The outer contact of the busy tone interrupter (60 IPM) per KS-5159-01 makes positive contact for $6 (\pm 1)$ revolutions of the motor shaft and remains open for the succeeding $12 (\pm 1)$ revolutions. The inner contact of the same spring assembly (120 IPM) makes positive contact for $7 (\pm 1)$ revolutions of the motor shaft and the center pair of contacts of the same spring assembly remains closed for $6 (\pm 1)$ revolutions. The break periods when both the inner and center contacts are open at the same time is $2.5 (\pm 1)$ revolutions of the motor shaft.
- 3.03 The outer contact of the busy tone interrupter (120 IPM) per KS-5352 makes positive contact for $4.5 (\pm 1)$ revolutions of the motor shaft and remains open for the succeeding $4.5 (\pm 1)$ revolutions of the motor shaft.
- 3.04 The inner contact of the busy tone interrupter (60 IPM) per KS-5319-01 makes positive contact for $9 (\pm 1)$ revolutions of the motor shaft and remains open for the succeeding $11 (\pm 1)$ revolutions. The outer contact of the same spring assembly (120 IPM) makes positive contact for $6 (\pm 2.5)$ revolutions of the motor shaft and the center pair of contacts of the same spring assembly remains closed for 6

(± 2.5) revolutions. The break periods when both the outer and center contacts are open at the same time are $4 (\pm 1)$ revolutions of the motor shaft.

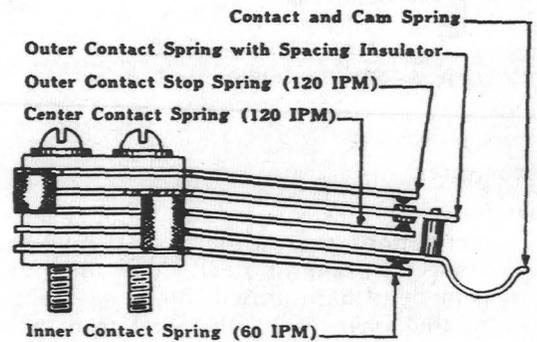


Fig. 4—Busy Tone Interrupter Springs KS-5319-01

Ringling Current Interrupters (See Fig. 5)

- 3.05 Four spring assemblies are furnished to supply machine ringling. The outer contact of only one ringling spring is closed at a time. There are not more than eight revolutions of the motor shaft between the opening of one outer contact and the closing of the next succeeding outer contact. Where a single spring is common to two pairs of contacts it makes contact with only one pair at a time.
- 3.06 Each outer contact of the ringling interrupters per KS-5159-01 and KS-5352 makes positive contact for $18 (+0 -4)$ revolutions and remains open for $54 (-0 +4)$ succeeding revolutions of the motor shaft, while each inner contact of the same spring assembly makes positive contact for $54 (+0 -4)$ revolutions and remains open for $18 (-0 +4)$ succeeding revolutions of the motor shaft.
- 3.07 Each outer contact of the ringling interrupters per KS-5319-01 makes positive contact for $20 (+0 -5)$ revolutions and remains open for $60 (-0 +5)$ succeeding revolutions of the motor shaft, while each inner contact of the same spring assembly makes positive contact for $60 (+0 -5)$ revolutions and remains open for $20 (-0 +5)$ succeeding revolutions of the motor shaft.

Contacts

- 3.08 The contacts of the springs of the interrupter mechanism are of a platinum-iridium alloy. They are capable of continuous operation under full load without excessive burning or pitting.

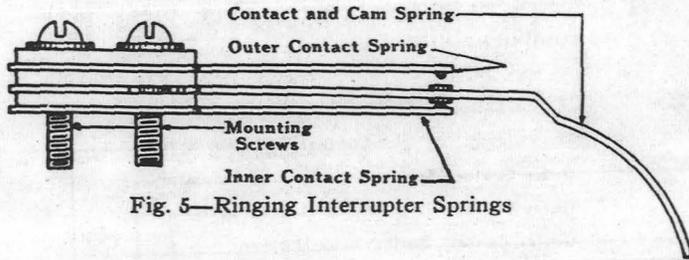


Fig. 5—Ringing Interrupter Springs

Armatures

- 3.09 The armature core is built up of sheet steel laminations pressed on a shaft made from a special grade of steel. The commutator is made of hard drawn copper segments insulated from each other and from ground by mica.

Machine Housings

- 3.10 The machine is totally enclosed so as to prevent the entrance of dirt and dust, but equipped with covers for the commutator, collector rings and interrupter mechanism which are secured by thumb screws or other equivalent means so that they may be readily removed to permit brush adjustment or contact and commutator cleaning.
- 3.11 The machine is mounted on an iron detail with jack and plug connections so that in the event of failure of the machine another can readily be substituted.

Bearings

- 3.12 The bearings are ball bearings. The bearing housings are provided with threaded grease holes, one in each main bearing, through which grease may be supplied to the bearing by means of a grease gun. A threaded plug is provided to keep out the dirt.

Connections

- 3.13 Fig. 2 shows the wiring diagrams for the QD-Type ringing machines per KS-5352, KS-5159-01 and KS-5319-01, with 12, 14 and 17 leads brought out of the respective machines. The black and black-red leads are connected to a supply source of 48 volts direct current, with the black lead on the positive and the black-red lead on the negative, through a 3 ampere fuse. The other leads are connected to the tone commutator brushes, associated transformer windings and interrupter springs as indicated in the figure. The KS-5159-01 and KS-5319-01 machines are the present standard.

Ringing Transformers

- 3.14 The a-c. voltage of the machine is too low for use directly and must be stepped up by a transformer. The ringing transformer used in stepping up this voltage is of the shell type with both the primary and secondary leads brought out on a common terminal board. Connections to the transformer are easily made by means of binding posts.

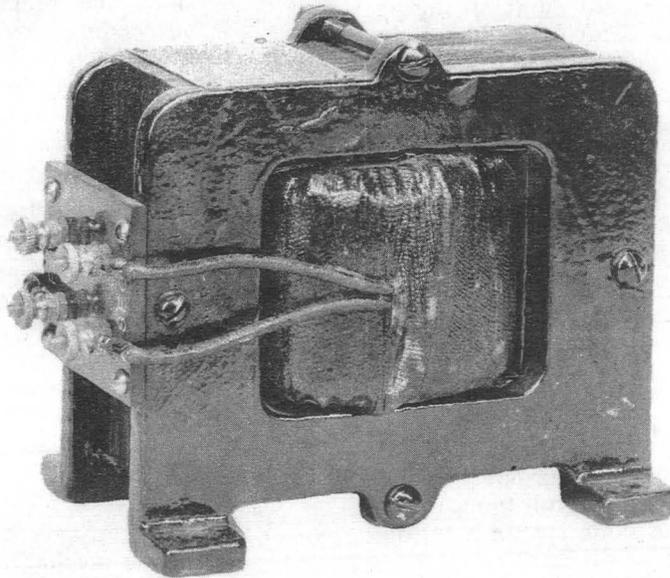


Fig. 6—Ringing Transformer