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J. D. BOEHLER ET AL

2,077,510

SPRING CONTACT GAUGE

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FIG. 1

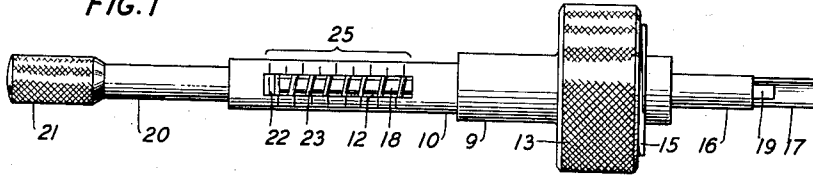


FIG. 2

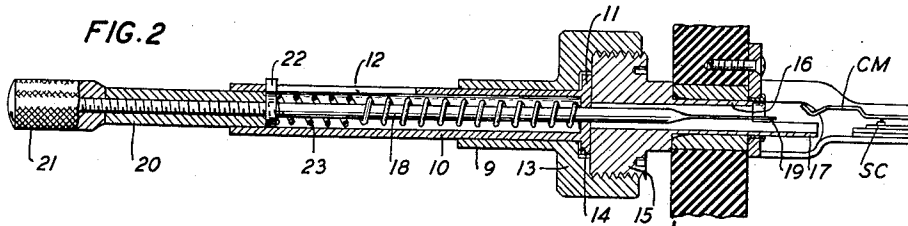


FIG. 3

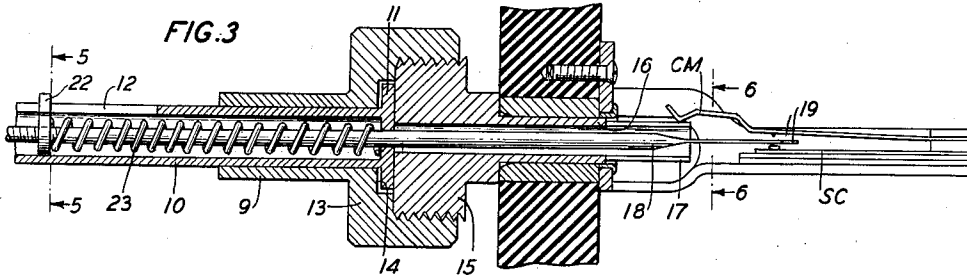


FIG. 4

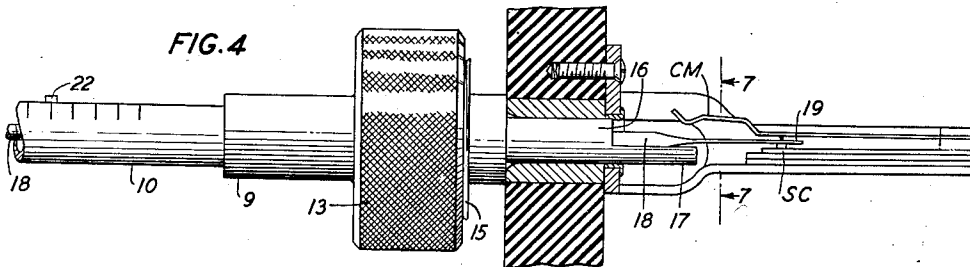


FIG. 5

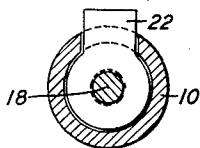


FIG. 6

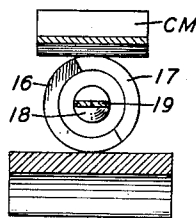
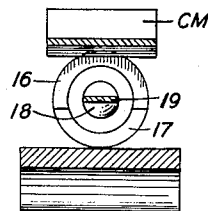


FIG. 7



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SPRING CONTACT GAUGE

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4 Claims. (Cl. 265—1)

This invention relates to gauging devices and more specifically to a gauge for measuring the engaged pressure between the contacts of a set of cooperating switching elements.

5 In telephone systems, for example, spring jacks are used in cooperation with plugs for effecting changes in circuit connections. These jacks, as is well known, are mounted in close proximity to each other on the rear of panels or boards. The
10 contact springs in these jacks engage each other with a predetermined contact pressure under the tension of one of the springs of the set.

In such contact devices, however, it has been found that the movable spring after a certain
15 number of switching operations loses a certain amount of its tension and thereby changes the pressure between the contacts of these springs, with consequent faulty electrical connections which necessitate the removal of the jacks from
20 the mounting panel, and the disconnecting of their wire connections to permit the testing of such contact elements, which entails considerable time and expense.

The object of this invention is to provide a tool
25 which can be inserted into a jack in the same manner as a plug, to indicate whether there is satisfactory contact pressure, thus avoiding the necessity of removing the jack from service.

The tool of this invention is provided with a
30 feeler member which is preferably thin, hard and smooth and is inserted between the contact springs and provided with a retractile spring for withdrawing it if there is insufficient friction to hold it in place. The tool is provided with a
35 camming member which may be rotated in the jack sleeve by the rotation of a knob to separate the contact springs to permit the insertion of the feeler member between them whereupon the camming member is restored to normal, and the
40 springs allowed to grip the feeler.

Referring to the drawing,

Figure 1 is an assembly view shown with the index in its retracted position;

45 Fig. 2 is a longitudinal sectional view showing the gauge in position in a jack sleeve;

Fig. 3 is an enlarged sectional view of the gauge, the camming member being shown in the operated position;

50 Fig. 4 is a view similar to that of Fig. 3 shown with the cam in its unoperated position and the feeler member gripped between the contact elements;

55 Fig. 5 is a cross-sectional view taken on line 5—5 of Fig. 3;

Fig. 6 is an end view of the gauge showing one of the operable contact elements and its support in cross-section taken on line 6—6 of Fig. 3; and
Fig. 7 is a view similar to that of Fig. 6 but showing the camming member in the normal non-operated position.

In the drawing 10 is a tubular support provided at one end with a circular flange portion 11 and at its middle portion with a longitudinal slot 12 provided for a purpose that will be hereinafter described in detail.

A knob 13 knurled at its periphery and having a sleeve portion 9, as shown in Figs. 1 and 4, is rotatably mounted on the tubular support 10. This knob is provided with a recess 14 shown in Figs. 2 and 3 for receiving the flange portion 11 of the tubular support 10 and is interiorly screw-threaded for engaging the head portion 15 with which the plug portion 16 and the camming portion 17 are integrally formed.

In the tubular support 10 is slidably mounted an axially movable rod 18 having at its end a thin, hard, smooth, metal feeler member 19. Its other end is screw-threaded for receiving a threaded sleeve 20 and a handle 21. On sleeve 20 is secured an index member 22 which is adapted to move in the slot 12 in tubular support 10. A helical spring 23, having one of its ends abutting the index member 22 and its other end the flanged member 11 of tubular support 10 serves to return the rod 18 to normal position as shown in Figs. 1 and 2. The index member 22 cooperates with a scale 25 on the tubular support for indicating the pressure of the switching elements on the feeler portion 19 of the rod.

The operation of the tool is as follows: The cam end of the gauge is inserted in a jack from the front of the jack mounting strip as shown in Fig. 2, and the knob 13 is revolved until it reaches a position where it will seat against its shoulder without being forced. The tube assembly, which turns freely and independently in the nut recess, is swung into a position so that the indicator is vertical. The knob 13 is now turned alternately in a clockwise and counter-clockwise direction with equal pressure and the "mid-point" of swing noted. The knob 13 is then given a quarter of a turn in either direction, keeping the indicator 22 vertical, and the rod 18 carrying the feeler member is pushed in until the indicator rests in a forward position. The rod is held in that position and the knob 13 is returned to its original "mid-point". The rod 18 and feeler member are then permitted to slowly retract under the pressure of spring 23. If the indicator 22 returns to its

original position, the contact pressure is unsatisfactory.

The force of friction is independent of the extent of area and directly proportional to the total normal pressure, and since the feeler member is so much harder and smoother than the contact, the coefficient of friction will not vary appreciably for contacts of different physical character. It is therefore possible to calibrate the retractile spring to withdraw the feeler member when the spring tension is the equivalent of the minimum manufacturers' requirements for certain types of jacks, i. e., 115 grams.

What is claimed is:

1. A device for measuring the engaged pressure between the contacts of two switching elements, said device comprising two relatively movable members, a spring associated with said members and adapted to be tensioned upon relative bodily movement therebetween, a gauge portion carried by one of said members and adapted upon relative bodily movement between said members to be projected into position to be engaged by the elements, the reactive effect of said spring on said members against the pressure of the contact on said gauge portion being an indication of the engaged pressure between the contacts.

2. A device for measuring the engaged pressure between the contacts of two switching elements, said device comprising a tubular supporting member, a rod slidably mounted in said member having a gauge portion at one end, a knob for manually imparting an axial movement to said rod for engaging said portion with said elements, and resilient means tensioned by the movement of said rod for retracting it against the pressure exerted by said elements on said gauge portion, and

means set by the relative movement of said rod in said support for indicating such a pressure.

3. A device for measuring the engaged pressure between the contacts of two switching elements, said device comprising a tubular support, a rod slidably mounted in said support having a gauge portion at one end, a knob for manually imparting an axial movement to said rod for engaging said gauge portion between said switching elements, resilient means tensioned by the movement of said rod in said support, and a plurality of cooperating indicating means set by the relative movement of said rod and said support for translating the tension of said resilient means in terms of the pressure effect of said elements on said gauge portion.

4. A device for measuring the engaged pressure between the contacts of cooperating switching elements of a jack, said device comprising a support, a plug mounted for rotating movement on said support for engaging the sleeve of the jack and having a camming element, means for rotating said plug for moving said cam in operative relation with one of the elements for opening the contacts thereof, a gauge member mounted in said support, means for axially moving said member in said support for engaging said elements whereby a movement of said camming element to normal is effective to release the operated element for gripping the gauge member between the elements, a retractile spring tensioned by the axial movement of said gauge member, an index carried by said gauge member, and a scale on said support cooperating with said index for translating the tension of said spring in terms of the gripping action of the elements on said gauge.

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