J. B. TAYLOR & W. S. BRALLEY.

TELEPHONE JACK BOX.

APPLICATION FILED AUG. 14, 1908.

919,394. Patented Apr. 27, 1909.

Fig. 1.

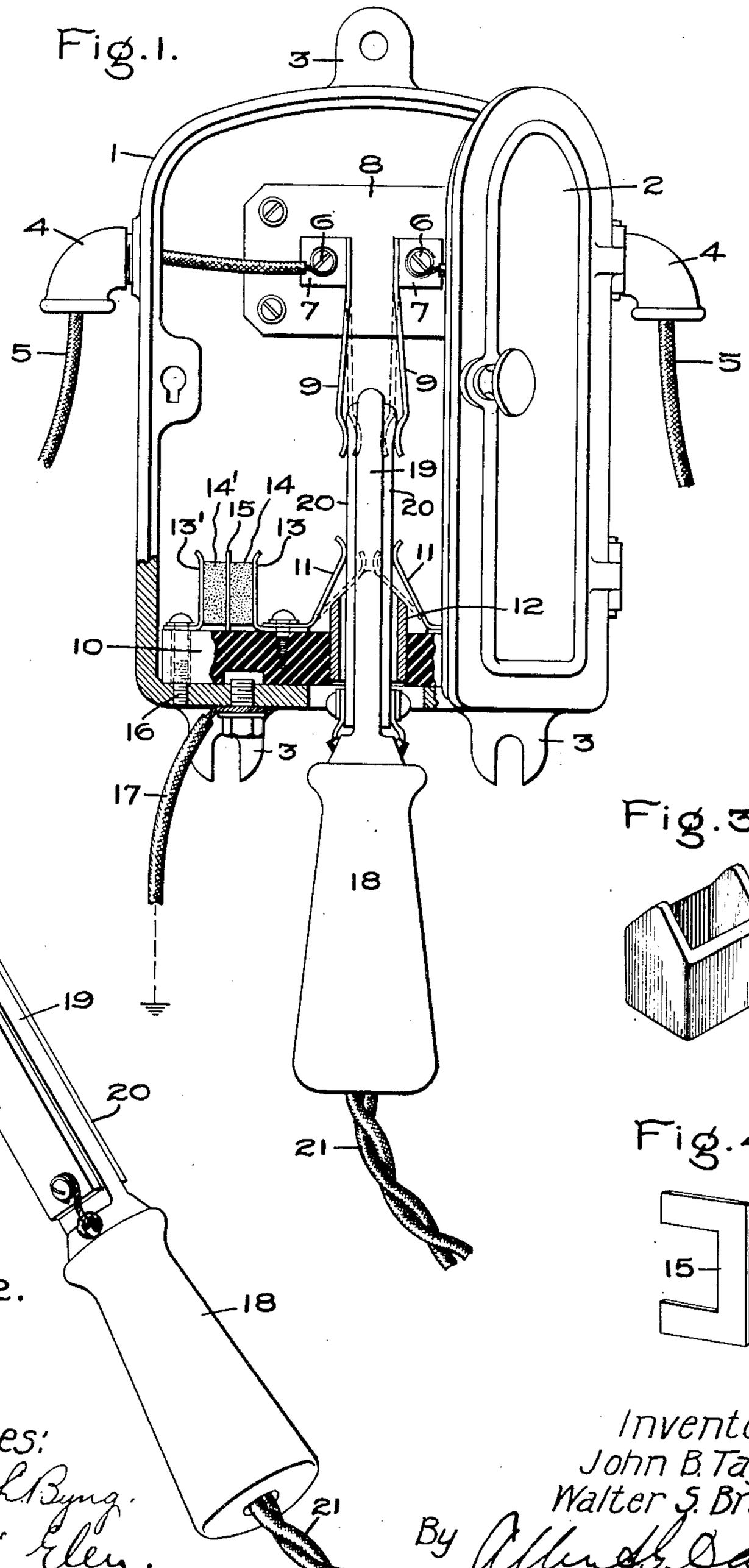

Fig. 2.

Fig. 3.

Fig. 4.

Witnesses:
Marcus L. Byng.
J. Ubi Elen.

Inventors:
John B. Taylor,
Walter S. Bralley,
By Allen & Dann Atty.

UNITED STATES PATENT OFFICE.

JOHN B. TAYLOR AND WALTER S. BRALLEY, OF SCHENECTADY, NEW YORK, ASSIGNORS TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

TELEPHONE JACK-BOX.

No. 919,394. Specification of Letters Patent. Patented April 27, 1909.

Application filed August 14, 1908. Serial No. 448,498.

To all whom it may concern:

Be it known that we, JOHN B. TAYLOR and WALTER S. BRALLEY, citizens of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Telephone Jack-Boxes, of which the following is a specification.

This invention relates to devices for protecting the users of electrical apparatus, such as telephone sets, from injury due to abnormal potentials with which the instrument circuit may be accidentally charged.

Electric railways are usually provided with telephone lines running parallel with the feeders and working conductors, and connected at intervals to jack-boxes on the posts supporting the overhead structure. The train crews are furnished with portable telephone sets having flexible conductors and jacks by means of which a telephone can be plugged in temporarily at any box. In general, the jack-boxes are so placed that a person using the telephone will stand on the ground, and inasmuch as the telephone lines are liable to acquire a heavy static charge from a lightning stroke, or by induction from the power line, there is always danger of shock to the operator. Moreover, the telephone line may become crossed with a trolley wire, producing conditions exceedingly dangerous to anyone attempting to cut in a telephone.

On account of the great number of jack-boxes used, it is essential to make them as simple and cheap as possible which renders it impracticable to equip each one of them with the usual forms of protective devices, such as fuses and lightning arresters, both on account of the expense of furnishing them and protecting them from the weather, and also because of the chance of numerous and extended troubles which would occur with so many pieces of apparatus liable to be put out of service and requiring frequent inspection and renewal.

Our invention aims to provide a jack-box which is simple in construction, inexpensive as to cost, and which provides a maximum of protection to the user.

The special feature of novelty is a ground connection normally separated from the telephone line by a gap which does not short-circuit said line in the case of a lightning discharge, and also great enough to withstand the normal working potentials on the telephone line, but which becomes effective to provide a ground circuit for abnormally high charges when the telephone is temporarily connected with the box. In other words, when a box is in use the operator is provided with the same protection as the user of a regularly installed telephone.

In the accompanying drawing, Figure 1 is a front elevation of our improved jack-box; Fig. 2 is a perspective view of the jack; Fig. 3 shows an insulating guide sleeve, and Fig. 4 shows the mica separator for the spark-gap.

The box 1 is of metal, preferably cast-iron, with a hinged door 2. It has perforated lugs 3 for fastening it to a trolley-post, and tubular inlet 4 on each side for the entrance of the branch conductors 5 brought down from the two wires of the telephone line. These conductors terminate at binding screws 6 in blocks 7 mounted on a piece 8 of insulating material secured to the back of the box. From each block depends a line spring 9, said springs being separated by sufficient space to avoid short-circuiting the line.

On the bottom of the box is a slab 10 of insulating material having a central hole registering with one in the bottom of the box to receive the jack. A pair of flat spring contacts 11 is secured to the slab 10, one on each side of said hole, and inclining toward each other and preferably touching to exclude dust and insects. A sleeve 12 of fiber or the like is seated in the hole in the slab 10 with a beveled upper end on which the contacts 11 rest. Each contact is in electrical connection with one or two plates 13, 13′ carrying conducting blocks 14, 14′ preferably of carbon. These blocks are slightly separated to form a spark-gap, being spaced apart by a U-shaped strip of mica 15 inserted between them. The plate 13′ is electrically connected with the box by a screw 16, and the box itself is grounded by a conductor 17. There are two sets of plates and carbon blocks, the one to the right in Fig. 1 being hidden by the door 2.

The jack-box has a handle 18 and a plug 19 of insulating material. The plug is somewhat flattened on opposite sides to receive the contact strips 20, to which are connected the wires 21 leading to the portable telephone set in the possession of the train-man.

The sleeve 12 is oblong in cross-section to fit the plug and to insure the proper positioning of said plug when inserted. The strips 20 connect the contacts 11 and the line springs 9 when the plug is pushed home, as shown in Fig. 1.

It will be observed that the insertion of the jack connects both sides of the telephone line to the ground circuit containing the spark-gaps between the carbon blocks. The resistance of this spark gap and the carbon blocks is sufficient to hold back any potentials impressed upon the line under ordinary working conditions, so that there is no leakage of current to ground. But in case the line becomes charged with high potential, either before or after the insertion of the jack and the completion of the ground circuit, this charge will, upon the insertion of the jack, instantly jump the spark-gap and pass to ground, thereby relieving the operator from all danger of shock. The invention thus affords entire protection to train crews and other persons using portable telephone sets, and at the same time affords a sufficient clearance to ground to prevent the box from giving trouble during thunder storms and in other abnormal conditions.

What we claim as new and desire to secure by Letters Patent of the United States, is,

1. A jack-box for portable telephones containing a protective device which is connected with the line only when the jack is inserted in said box.

2. A jack-box for portable telephones containing one or more grounded spark-gaps adapted to be connected in parallel with the telephone when the jack is inserted in said box.

3. A telephone jack-box containing lime springs, one or more grounded spark-gaps, and contacts in circuit therewith and adapted to be placed in circuit with the line springs by a jack.

4. A telephone jack-box containing line springs, two pairs of plates carrying conducting blocks separated by a spark-gap, a ground connection for one plate of each pair, and means whereby the other plate can be connected with its respective line spring when a jack is inserted.

5. A jack-box made of metal and connected to ground, a slab of insulating material in said box, two pairs of plates mounted on said slab, one plate in each pair being connected with the box, a block of conducting material on each plate, an insulating spacer separating the blocks of a pair, and adjacent contacts connected with the non-grounded plate and adapted to be engaged by a jack thrust in to engage the line springs.

In witness whereof, we have hereunto set our hands this 13th day of August, 1908.

JOHN B. TAYLOR.
WALTER S. BRALLEY.

Witnesses:
BENJAMIN B. HULL,
HELEN ORFORD.