

A. T. & C. H. LUTHER.

TEST CLIP.

APPLICATION FILED APR. 14, 1909.

953,678.

Patented Mar. 29, 1910.

Fig. 1.

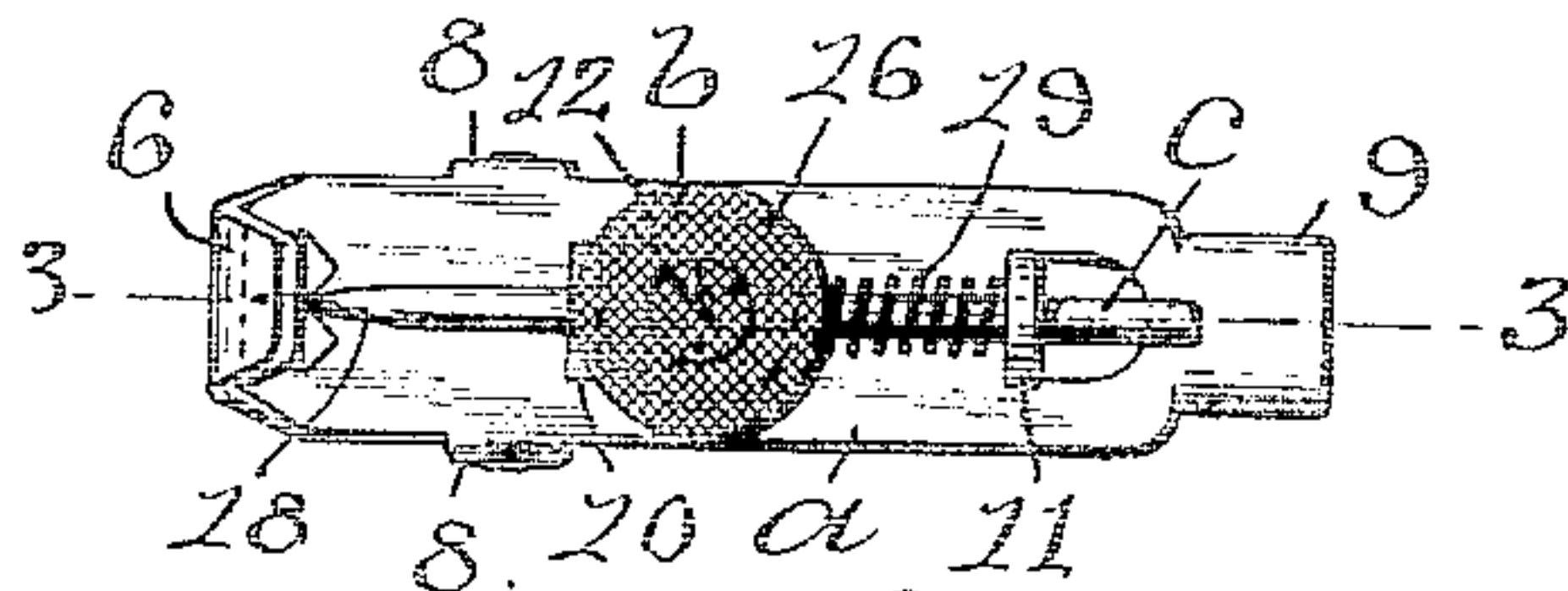


Fig. 2.

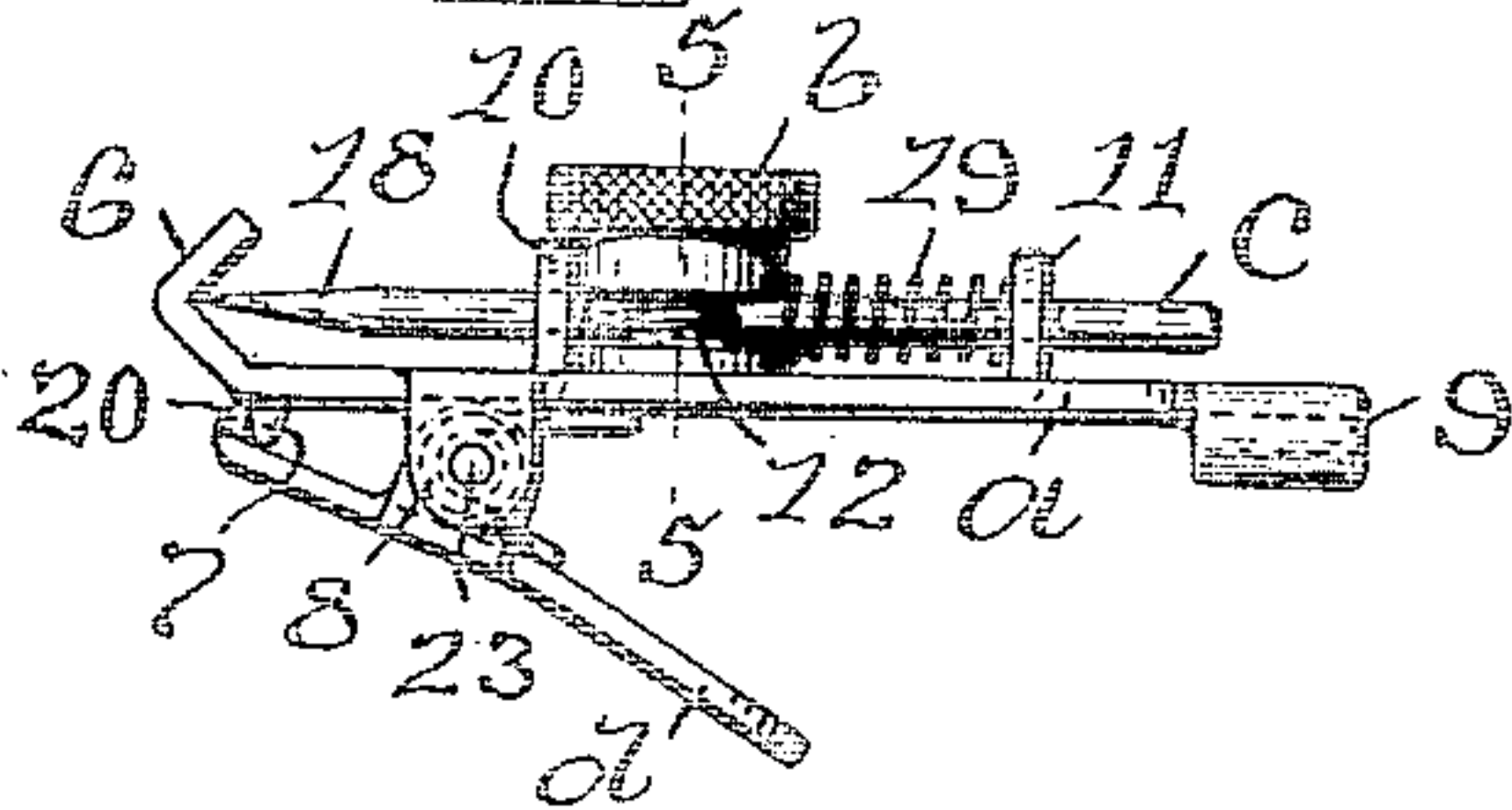


Fig. 3.

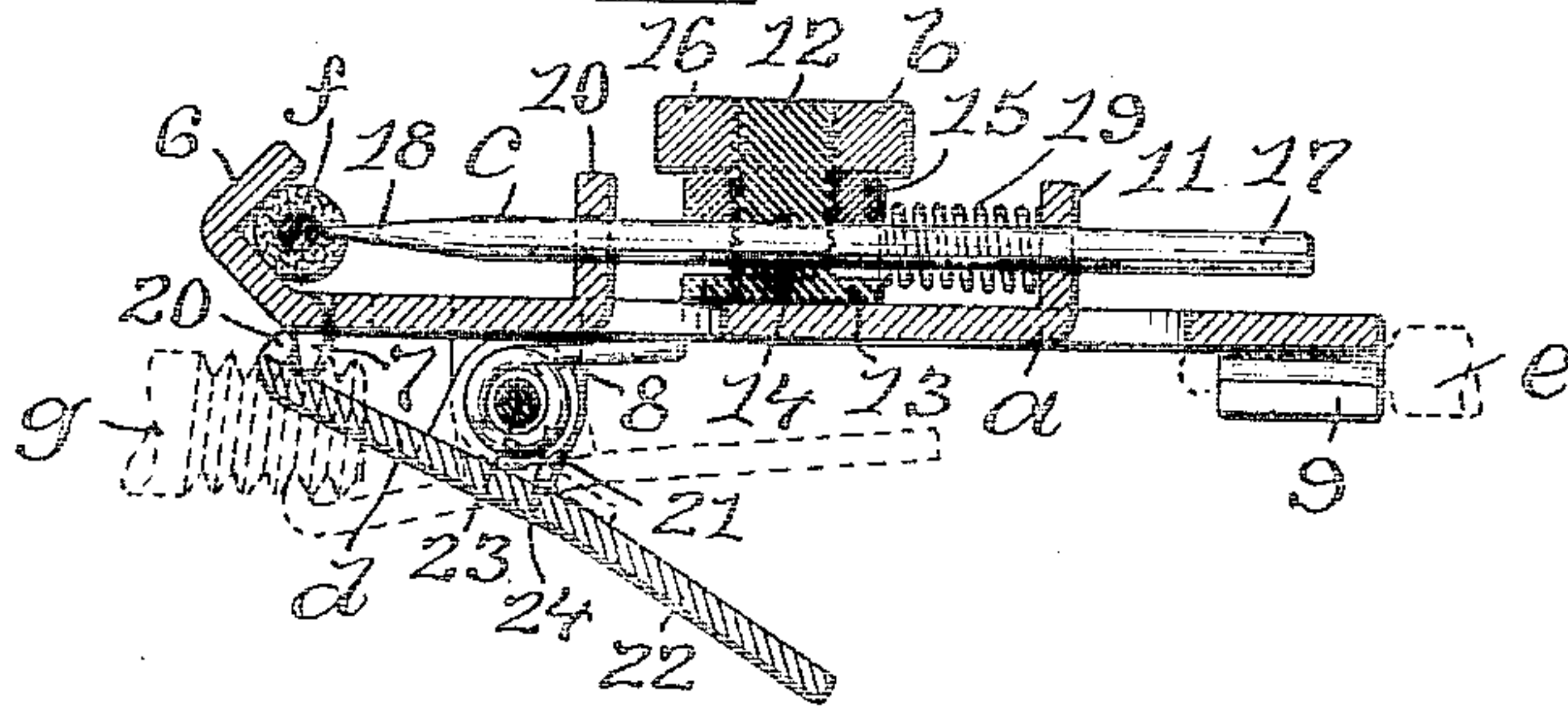


Fig. 4.

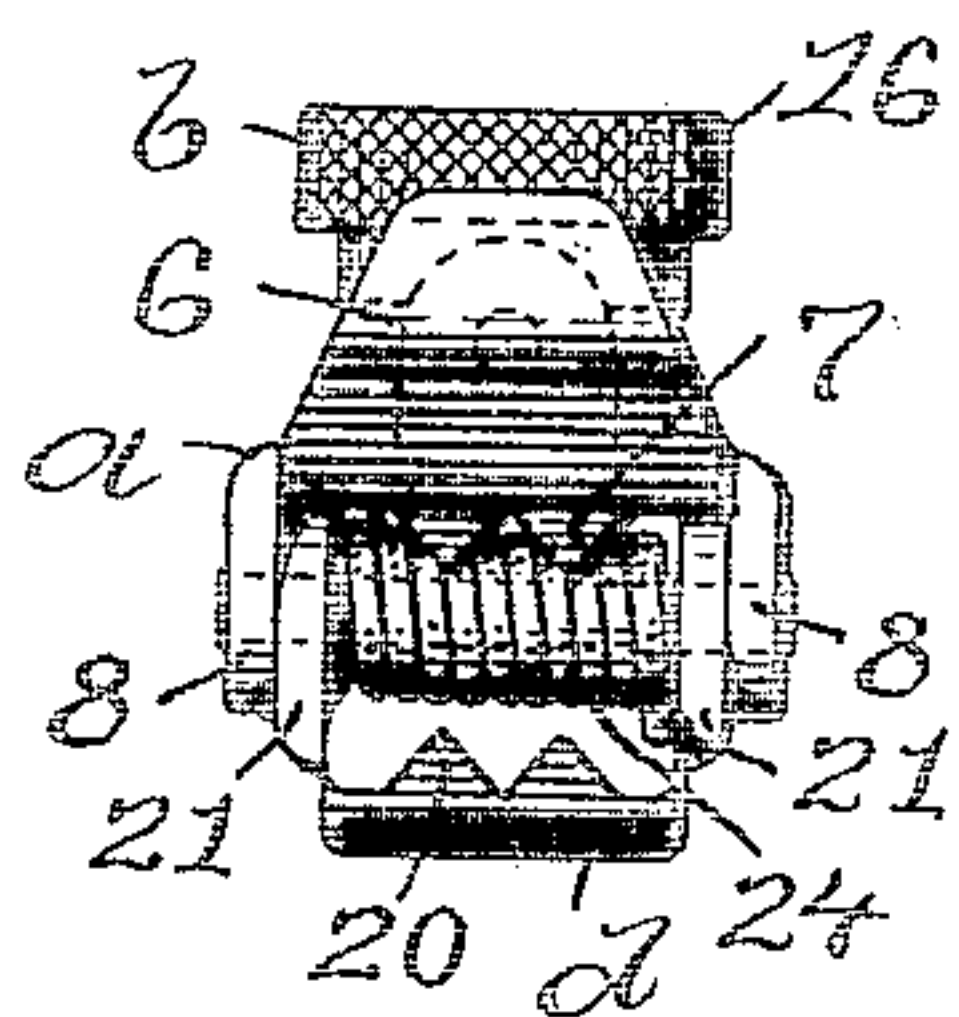
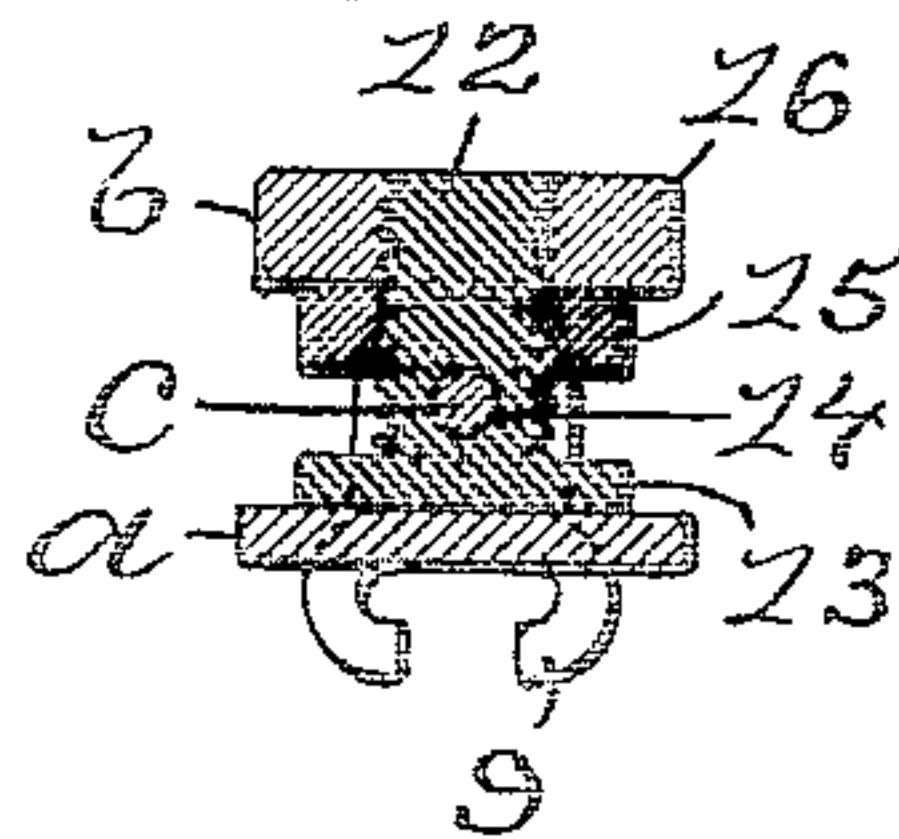


Fig. 5.



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# UNITED STATES PATENT OFFICE.

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## TEST-CLIP.

953,678.

Specification of Letters Patent. Patented Mar. 29, 1910.

Application filed April 14, 1909. Serial No. 429,902.

*To all whom it may concern:*

Be it known that we, ANDREW T. LUTHER and CHARLES H. LUTHER, citizens of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Test-Clips, of which the following is a specification.

This invention has reference to an improvement in fasteners and more particularly to an improvement in test clips used in telephone equipments, such as test sets, for testing electrical lines or circuits.

Test clips are generally used for obtaining an electrical connection between insulated wire to be tested and the test set cord. As heretofore usually constructed, the operator is generally obliged to remove the insulation from the wire to fasten the clip onto the wire so as to form an electrical connection between the clip and the wire. This removing the insulation from the wire requires time and is detrimental to the life and operation of the wire. Time and skill also are required for recovering the wire where the insulation has been removed, which cannot be done by hand the same as the original insulation, thereby causing liability of trouble on the line from defective insulation.

The object of our invention is to improve the construction of a test clip for telephone lines or circuits whereby the clip may be secured to an insulated electric wire and electrically connected to the wire without removing, destroying or materially injuring the insulation on the wire.

A further object of our invention is to construct a test clip so that the clip may be mechanically and electrically secured to either an insulated wire or a binding post or other electrical connections.

Another object of our invention is to facilitate the operation of the clip, whereby the clip may be secured and electrically connected to either an insulated wire or binding post without changing the position of the clip in the hand.

Another object of our invention is to construct a test clip so that the only part liable to wear or breakage may be easily and quickly renewed at a nominal cost, thereby prolonging the life of the clip.

Our invention consists in the peculiar and

novel construction of a test clip having a frame, a rigid jaw on the frame, a slide on the frame, a needle carried by the slide in alinement with the rigid jaw, a clamping jaw pivotally secured to the frame, means for reciprocally supporting the slide on the frame, means for detachably securing the needle to the slide, means for holding the slide in the forward position under spring tension, means for holding the clamping jaw in the closed position under spring tension and details of construction as will be more fully set forth hereinafter and claimed.

Figure 1 is a top plan view of our improved test clip with the slide in the normal position. Fig. 2 is a side view of the clip showing the slide in the normal position and the clamping jaw in the closed position. Fig. 3 is an enlarged longitudinal sectional view taken on line 3, 3 of Fig. 1 through the clip, showing the clip mechanically and electrically connected to an insulated wire, shown in cross section, the clamping jaw in the closed position in full lines and in the position it would assume in clamping the clip to a binding post, in broken lines. Fig. 4 is an enlarged forward end view of the clip with the clamping jaw in an open position, and Fig. 5 is an enlarged transverse sectional view through the clip taken on line 5, 5 of Fig. 2.

In the drawings, *a* indicates the frame of our improved test clip, *b* the slide, *c* the needle, *d* the clamping jaw, *e* a test cord shown in broken lines, *f* an insulated electric wire shown in cross sections in the clip and the end of a binding post shown in broken lines, to illustrate the adaptability of our invention.

The frame *a* is constructed preferably of sheet metal shaped to have an upwardly bent V shape rigid jaw 6 on its forward end, the downwardly bent teeth 7 at the base of the jaw 6, the adjacent downwardly bent side ears 8, 8, a semi-tubular rear end 9, by which the clip is secured to a test cord *e* by solder or other means, a central upwardly bent transverse ear 10, adjacent the ears 8, 8, and having a central hole for the needle *c*, and a central upwardly bent transverse ear 11, adjacent the end 9, and having a central hole in alinement with the hole in the ear 10, for the needle *c* as shown in Fig. 3.

The slide *b* consists of a screw 12 having a



flat-head 13, adapted to slide on the top of the frame *a* between the ears 10 and 11, a transverse hole 14, in the shank of the screw for the needle *c*, an internal screw-threaded collar 15, and a knurled nut 16.

The needle *c* has a round shank 17, and a pointed end 18, and is removably secured to the slide *b*, by inserting the needle through the holes in the ears 11 and 10, and the hole 14 in the slide, into a predetermined position, screwing the collar 15 down on the screw 12, onto the needle and screwing the nut 16, down on the screw 12, onto the collar 15. A coiled spring 19 is placed on the needle intermediate the slide *B* and the ear 11, and acts on the slide to hold the slide in its forward position under spring tension.

The clamping jaw *d* is constructed preferably of sheet metal and has the teeth 20 on its forward end, the upwardly bent side ears 21, 21, adjacent the center of the jaw and a rearwardly extending arm 22 for opening the jaw, which is pivotally secured to the ears 8, 8, by a pin 23, which extends through holes in the ears 8, 8, and 21, 21, and is riveted at each end to the ears 8, 8. A comparatively heavy coiled spring 24 surrounds the pin 23, one end of the spring bearing on the bottom of the frame *a* and the opposite end of the spring bearing on the inside of the arm 22, of the jaw *d* whereby the jaw is held in the closed position under spring tension, with the teeth 20 on the jaw *d* overlapping the teeth 7 on the frame *a*, as shown in Figs. 2 and 3.

When assembled the pointed end 18 of the needle *c* is always in alinement with the center of the V shape jaw 6 of the clip and the end 9 of the clip is electrically connected to the test cord *c*, (shown in broken lines in Fig. 3) which is electrically connected to the test set not shown. The V shape jaw 6 is shaped to receive different size wires and to automatically center the wires relative to the point of the needle *c*.

In the operation of our improved test clip an insulated wire is tested by moving the slide *b* back against the tension of the spring 19, hooking the V shape jaw 6 over the wire and forcing the slide *b* forward, thereby forcing the pointed end 18 of the needle *c* through the insulation on the wire and into the wire sufficiently to form an electrical contact with the wire, as shown in full lines in Fig. 3. The current now passes from the wire *f* through the needle *c*, the frame *a* and the test cord *c* to the test set, or if a binding post or similar electrical connection requires testing the clamping jaw *d* is opened and the clip secured to the connection by clamping the connection between the teeth 7, on the frame *a* and the teeth 20, on the clamping jaw as shown in broken lines in Fig. 3.

The test clip is so constructed and designed that when properly held in the hand,

the thumb will operate the slide 6 and the index finger the clamping jaw *d* (while the end 9 prevents the clip slipping in the hand) without changing the position of the clip in the hand, thereby facilitating the operation of securing the clip either to an insulated wire or to a binding post or other electrical connections.

It is evident that the construction of our improved test clip may be varied without materially affecting the spirit of our invention.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:—

1. In a test clip, a frame, a slide reciprocally supported on the frame, means on the frame for reciprocally supporting the slide a detachable piercing member carried by the slide and adapted to pierce the insulation on an insulated wire and electrically connect the wire to the test clip, and a jaw on the frame adapted to automatically center the wire relative to the piercing member.

2. In a test clip, a frame, a slide reciprocally supported on the frame, a piercing member carried by the slide and adapted to pierce the insulation on an insulated wire and electrically connect the wire with the test clip, a jaw on the frame adapted to automatically center the wire relative to the piercing member and means for removably securing the piercing member to the slide.

3. In a test clip, a frame, a slide reciprocally supported on the frame, a piercing member carried by the slide, and adapted to pierce the insulation on an insulated wire and electrically connect the wire with the test clip, a jaw on the frame adapted to automatically center the wire relative to the piercing member, means for removably securing the piercing member to the slide and means for holding the slide in its normal forward position under spring tension.

4. In a test clip, the combination of a frame, a slide reciprocally supported on the frame, a detachable piercing member carried by the slide, a fixed jaw on the frame in alinement with the piercing member, a toothed jaw formed integral with the frame and a clamping jaw pivotally secured to the frame in a position to coact with the toothed jaw and means for holding the clamping jaw in the closed position under spring tension.

5. In a test clip, the combination of a frame, a slide reciprocally supported on the frame, a piercing member carried by the slide, a fixed jaw on the frame in alinement with the piercing member, teeth on the frame at the base of the fixed jaw and formed integral with the frame and a clamping jaw having teeth, means for pivotally securing the clamping jaw to the frame in a position for the teeth on the clamping jaw to coincide



with the teeth on the frame and means for holding the clamping jaw in the closed position under spring tension.

6. In a test clip, the combination of the  
5 following instrumentalities, a frame shaped  
to have an upwardly bent V shaped jaw on  
its forward end, downwardly bent teeth at  
the base of the jaw, adjacent downwardly  
bent side ears, a semi-tubular rear end, two  
10 central upwardly bent transverse ears on the  
top, each ear having a central hole, a slide  
consisting of a screw having a flat head  
adapted to slide on the top of the frame and  
a transverse hole in the shank of the screw,  
15 a screw-threaded collar on the screw and a  
knurled nut on the screw, a needle having a  
round shank and a pointed end removably  
secured to the slide, through the hole in the  
screw shank, by the collar and nut and slid-  
20 ably secured to the frame by passing the

needle through the holes in the two up-  
wardly bent ears on the frame, a clamping  
jaw having teeth on its forward end, up-  
wardly bent side ears and a rearwardly ex-  
tending arm, means for holding the slide 25  
with the needle in its forward position un-  
der spring tension, means for pivotally secur-  
ing the ears on the clamping jaw to the  
downwardly bent ears on the frame and  
means for holding the clamping jaw in the 30  
closed positions under spring tension.

In testimony whereof, we have signed our  
names to this specification in the presence of  
two subscribing witnesses.

ANDREW TOMPKINS LUTHER.  
CHARLES HENRY LUTHER.

Witnesses:

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