

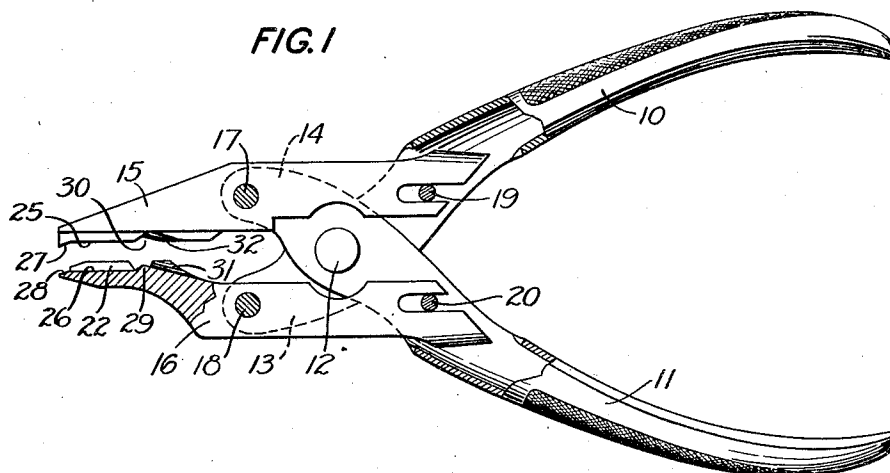
Jan. 6, 1931.

W. T. PRITCHARD

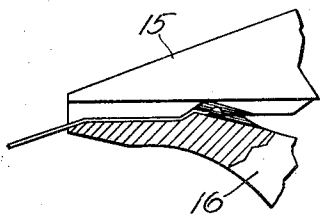
1,788,031

FORMING TOOL

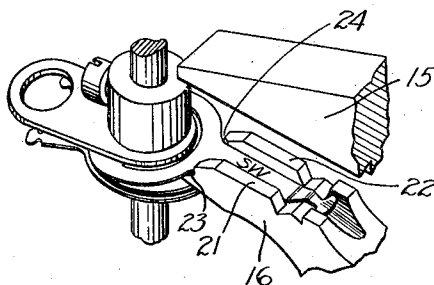
Filed Jan. 5, 1929



**FIG. 2**



**FIG. 3**



INVENTOR  
**W. T. PRITCHARD**  
BY *Irving Mac Donald*  
ATTORNEY

## UNITED STATES PATENT OFFICE

WILLIAM T. FRITCHARD, OF MAPLEWOOD, NEW JERSEY, ASSIGNOR TO BELL TELEPHONE LABORATORIES, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

## FORMING TOOL

Application filed January 5, 1929. Serial No. 330,458.

This invention relates to forming tools of a type which is particularly well adapted for use for adjusting the tension of switch springs used in certain telephone switching apparatus.

In selector and connector switches for example, switch springs are insulatedly mounted on a common sleeve, which in turn is mounted on the switch shaft. These brushes are adapted to engage selectively and with a uniform contacting pressure terminals disposed in a number of superposed rows, which selection is effected according to the operation of the switch. When such a switch has performed a great number of operations, owing to the wear in the contacting surfaces of the switch springs and the disalignment of the springs with the terminal rows which may be due to accidental injury or to the wear in the operating parts of the switch, these switches no longer operate properly.

Heretofore it was customary to remove the switch spring units from their shafts and to replace them by new spring units.

The object of this invention is the provision of a suitable forming tool for adjusting such switch springs in a simple and positive manner and without the necessity of removing the springs from the switch shaft.

The tool of this invention consists of a pair of pivoted handles equipped with jaws having cooperating registering portions between which the spring to be reformed is placed so that when pressure is applied to the handles, the spring takes the configuration of the jaw registering portions and is simultaneously given the required tension.

In the drawings Fig. 1 is an assembly view of the tool showing the jaws in the open position, the handle being partially cut away;

Fig. 2 is a partial view of the jaws shown in the closed position with the spring in position therebetween;

Fig. 3 is a partial view of a spring unit shown in perspective with one of the springs in position in the lower jaw of the tool;

Fig. 4 is a perspective view of a spring previous to the bending operation; and

Fig. 5 is a perspective view of two cooper-

ating switch springs subsequent to the forming operation.

In Fig. 1 of the drawings 10 and 11 are handle levers which are pivoted as at 12. On the effective lever portions 13 and 14 of these handles there are mounted jaw members 15 and 16 which are held in parallel relation to each other by pivots 17 and 18 and studs 19 and 20 carried by the effective lever portions and the handle members, respectively.

Jaw member 15 is mounted on pivot 17 carried by the effective lever portion 14 of handle 11 and one end of the jaw is slotted for engagement with stud 19 carried by handle 10. Similarly, jaw member 16 is mounted on pivot 18 carried by the effective lever portion 13 of handle lever 10 and one end of this jaw is slotted for engagement with stud 20 carried by handle lever 11. By virtue of this construction the pivotal movement of handle levers 10 and 11 from the open to the closed position or vice versa is ineffective to change the parallel relation of the jaw members 15 and 16.

Jaw 16 comprises ridges 21 and 22 which form a channel provided for readily positioning the switch spring or wiper to be formed in line parallel to the length of the cooperating jaw members. The outward end of the ridges 21 and 22 terminate in the form of stops 23 and 24 against which the body portion of the spring wiper abuts.

The cooperating effective or forming portions of jaws 15 and 16 comprise two main cooperating plane surfaces 25 and 26, one being that of the ridge carried by the jaw member 15 and the other that of the bottom of the channel formed by the ridges 21 and 22 carried by jaw member 16, the cooperating cam and beveled portions 27 and 28, the ridge or cam 29 and recess 30 and the cooperating concave and convex surfaces 31 and 32 provided for bending lug portions of the spring outwardly to facilitate the engagement of the spring with its associated terminals in the bank.

In a typical example of operation after the spring has been flattened in any suitable manner, as shown in Fig. 4, the jaw 16 is inserted in a position between two springs

as shown in Fig. 3 in a manner that the ends of ridges 21 and 22 engage a body portion of the switch wiper with the spring resting on the main plane surface 26 between the guiding ridges 21 and 22. The jaws 15 and 16 are then brought together by the movement of handles 10 and 11 whereby the switch wiper is forced to take the configuration of the cooperating forming portion in the jaws, the bend imparted to the spring adjacent its body portion being effective to give the proper tension to the spring in order to assure proper contact pressure on the terminal in the bank with which it is associated and thus avoiding further adjustment of the switch spring subsequent to the bending operation with the tool of this invention.

Applicant has discovered that a too high tension of the spring on the contact has the effect of causing the spring to wear rapidly and that insufficient tension of the spring on its terminal fails to establish proper circuit connection with the consequent interfering in the proper transmission of speech. By the use of the tool of this invention, such inconvenience is effectively avoided and a great amount of time is saved due to the fact that the proper forming and tensioning of the spring are made simultaneously.

What is claimed is:

1. A tool for reforming switch springs comprising a pair of jaw members, actuating means therefor having means for maintaining the jaws parallel, forming and tensioning means on said jaws comprising two cooperating plane surfaces extending longitudinally of the jaws, that on one jaw being bounded by ridges forming a channel and that on the other jaw being a ridge, cooperating cam and beveled portions on the free ends of the channel and rib, cooperating cam and recess portions at the end of the channel formed by said plane surfaces and said ridges, and cooperating concave and convex portions adjacent said latter cam and recess portions.

2. A tool for reforming switch wipers comprising a pair of pivoted handles, a pair of parallel jaws mounted thereon, forming and tensioning means on said jaws comprising two cooperating plane surfaces, that on one jaw being bounded by ridges forming a channel and that on the other jaw being a ridge, cam and beveled portions on the free ends of the channel and rib, and cooperating cam and recess portions at the end of the channel formed by said plane surfaces and ridges.

In witness whereof, I hereunto subscribe my name this 31st day of December, 1928.

WILLIAM T. PRITCHARD.