May 7, 1929. C. M. ROBINSON 1,711,692

SPRING ADJUSTER

Filed July 29, 1925

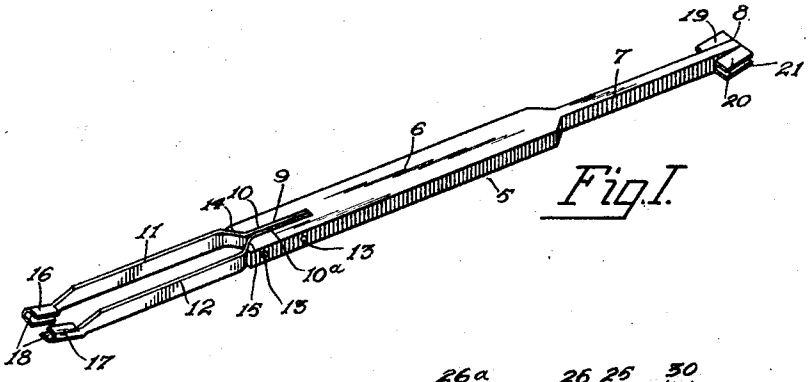


Fig. 1.

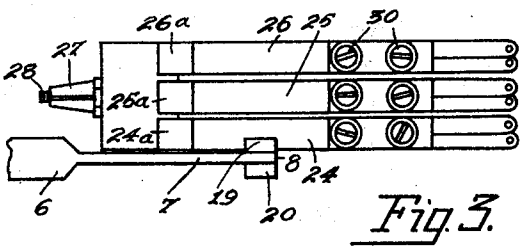
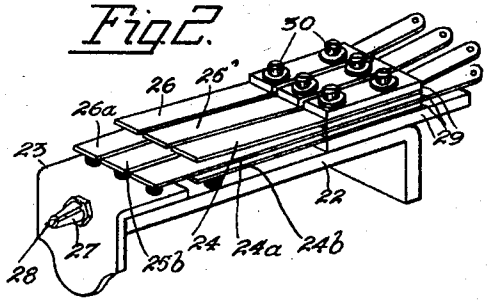


Fig. 3.

Fig. 2.



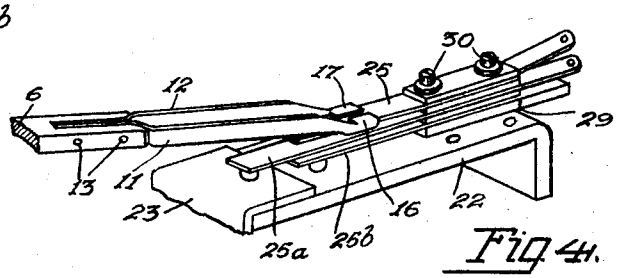


Fig. 4.

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UNITED STATES PATENT OFFICE.

CLARENCE M. ROBINSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SPRING ADJUSTER.

Application filed July 29, 1925. Serial No. 46,930.

My invention relates to spring adjusters and more especially to spring adjusters for contact springs for electrical apparatus, such as relays and the like as used in telephone switchboards.

An object of my invention is to provide a tool cheap and simple of construction and highly efficient in use. A tool of this sort is very essential to maintain the maximum efficiency of a telephone switchboard or a similar structure in which a large number of electrically operated relays are employed, because of the necessity of frequent adjustment of the contact springs of the relays.

In telephone systems, the relays are mounted very closely together in shelves or strips to economize in space, and the relays sometimes have several sets of springs. Due to this condition the spring adjusters of the prior art have been very inefficient in their operation, as it was very hard to readily fit said spring adjusters to the different relay springs. It is an object of my invention to overcome the above objections and others by constructing my device so that it may readily be applied to all the different springs of the different relays.

For a clear understanding of my invention reference may be had to the accompanying drawing in which like reference characters denote like parts in the different figures, and in which:

Fig. 1 is a perspective view of the spring adjuster of my invention;

Fig. 2 is a view of the contact springs and armature of an electrical relay;

Fig. 3 is a plan view of Fig. 2 showing a part of my spring adjuster in position for use; and

Fig. 4 is a view showing the method used in adjusting the inside contact springs of a group of contact springs.

My spring adjuster 5 is composed of any suitable metal and consists of a body portion 6 provided with a narrowed portion 7 which has an enlarged end 8. The other end of the body portion 6 is provided with a slot 9 into which the ends 10 and 10^a of a pair of members 11 and 12 are inserted. The ends 10 and 10^a are held in the slot 9 by means of a force fit and are doubly secured by pins 13 which extend into suitable orifices provided in the body portion 6 and the ends 10 and 10^a. These pins are maintained in position by a force fit. The slot 9 widens at the end and the members 11 and 12 are shaped so as to rest against the portions 14 and 15 formed by the widening of the slot 9. This form of shaping gives additional strength and secureness to the members 11 and 12. The other ends of the members 11 and 12 are formed into U-shaped portions 16 and 17 set at a slight angle with the members 11 and 12. The U-shaped portions 16 and 17 have grooves 18 which are deep enough to assure a firm grip on a contact spring for adjusting purposes. The portions 16 and 17 are suitably separated a distance sufficient to allow the grooves 18 to encompass the contact spring which is to be adjusted, and each groove 18 is of a size to receive a contact spring as illustrated in Fig. 4.

The enlarged end 8 of the portion 7 is comprised of portions 19 and 20 integrally formed with the portion 7 and set at an angle thereto. These portions 19 and 20 are spaced a suitable distance to allow them to be placed one on either side of a contact spring, the said contact spring resting in the space 21 between the parts 19 and 20 which are of a size to grip the said contact spring for adjustment.

In Fig. 2 is illustrated a relay heel iron 22 which supports an armature 23 and three sets of contact springs adapted to be actuated by the said armature 23. Each of the sets of contact springs comprises three springs, namely 24, 24^a and 24^b comprising one group, 25, 25^a and 25^b comprising a second group, and 26, 26^a comprising the third group. Any number of springs may comprise a group of springs. Springs 25^b and 26^b are not shown in Fig. 2 but 25^b is shown in Fig. 4. The armature 23 is pivotally secured to the supporting iron 22 by means of a nut 27 which has screw threaded engagement with a screw 28 fastened to the supporting iron 22. The contact springs are suitably insulated from each other by insulators 29, which are supported, together with the contact springs, by means of screws 30 to the supporting iron 22. The armature 23 is adapted to break the contact between the springs 24^a and 24^b, 25^a and 25^b, 26^a and 26^b and to cause the contact springs 24^a, 25^a and 26^a to enter into engagement with the springs 24, 25 and 26 respectively. All of which is well understood by one skilled in the art.

To adjust one of the outside sets of the springs the end 8 is used. The parts 19 and 20 are slipped one on each side of a contact spring such as 24 in Fig. 3 so the spring 24 will be in the groove 21. The parts 19 and

20 being set at an angle in relation to the body portion of the adjuster allows for a certain amount of up and down movement and this movement because of the firm grip of the parts 19 and 20 upon the spring 24 causes the said spring 24 to be bent in any direction desired to properly adjust the spring to any position. The groove 21 is provided on both sides of the end 8 which enables the adjuster to engage with springs regardless of the side of the group upon which the said spring is located.

The adjusting fingers of my adjusting tool are placed at such an angle to the main body portion thereof as to permit easy access to the springs and so as to provide plenty of iron, between adjacent shelves of relays, to adjust the springs of the different relays.

For adjusting a spring such as spring 25 which has other sets of springs located on each side of it, the other end of the adjuster is used. It is slipped on to a spring so that the parts 16 and 17 are engaging the said spring 25, which rests in the grooves 18 which are of a size to securely grasp the spring 25. The parts 16 and 17 are set at an angle to the rest of the adjuster and is best illustrated in Fig. 4 of the accompanying drawing. This allows for a certain amount of leverage which is sufficient to bend the spring 25 or any other spring into any desired position when force is exerted on the body of the spring adjuster without any interference whatsoever.

While my invention has been described in a specific application I do not wish to be limited to such application but desire to cover any changes or modifications as come within the spirit and scope of the appended claims.

Having described my invention what I claim as new and desire to secure by United States Letters Patent is:

1. A device of the character described including a body portion having a slot with a flaring end, a pair of parallel extending members, each having one of their ends shaped to fit in said slot, said extending members being rigidly secured to said body portion by means of a force fit and a pair of pins passing through said body portion and the ends of said extending members located in said slot, U-shaped members integrally formed with the other ends of said extending members, a pair of members integrally formed with each other and with a reduced portion of said body portion, said members being parallel to each other and separated a predetermined amount to form an outwardly extending slot adapted to receive a spring whereby said parallel members may engage and adjust said spring, said body portion adapted solely to support said pair of members which engage opposite sides of said spring.

2. A device of the character described including a pair of U-shaped portions and a plurality of parallel members integrally formed with a body portion, said body portion having a longitudinal slot provided with a flaring end, a pair of extending members formed with said U-shaped portions, said U-shaped portions set at an angle thereto, said extending members being parallel to each other at all times and shaped to fit said slot in said body portion, said parallel extending members being rigidly secured to said body portion by the force fit of said members in said slot and by means of a pair of pins passing through said body portion and the ends of said parallel extending members located in said slot, said U-shaped members adapted to simultaneously engage a spring to adjust said spring, and said plurality of parallel members being paired to form an outwardly extending opening lateral to and substantially parallel to said body portion to engage and adjust a spring.

Signed by me at Winter Park, in the county of Orange and State of Florida, this 21st day of July, 1925.

CLARENCE M. ROBINSON.