

E. B. CRAFT.
 SWITCH KEY.
 APPLICATION FILED MAY 14, 1910.

1,012,125.

Patented Dec. 19, 1911.

Fig. 1.

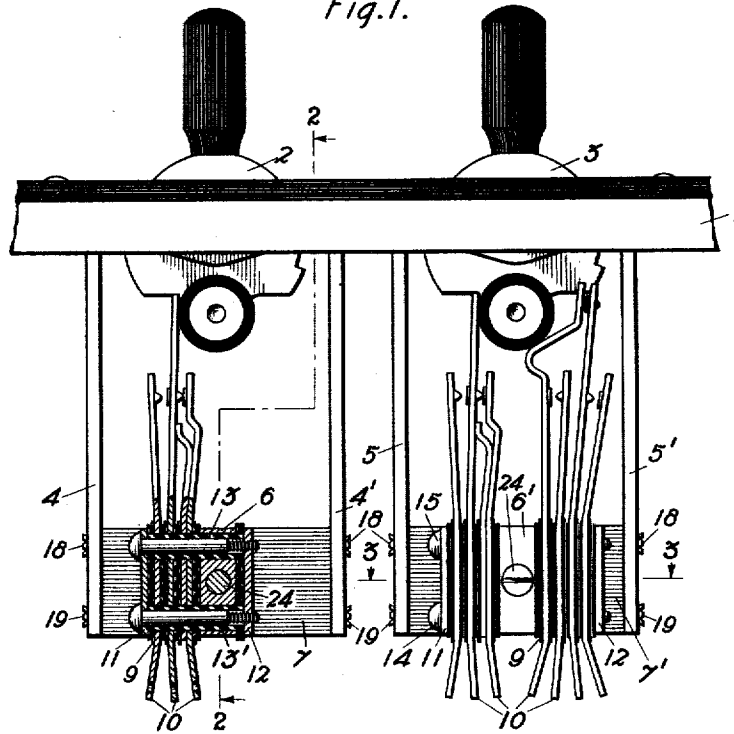


Fig. 2.

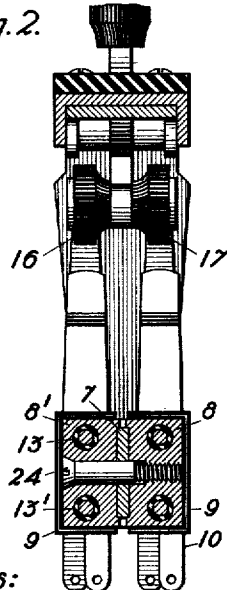


Fig. 3.

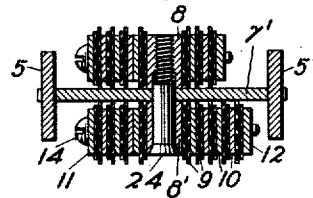
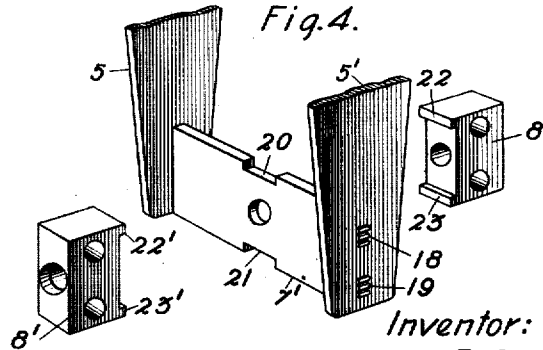


Fig. 4.



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UNITED STATES PATENT OFFICE.

EDWARD B. CRAFT, OF HACKENSACK, NEW JERSEY, ASSIGNOR TO WESTERN ELECTRIC COMPANY, OF NEW YORK, N. Y., A CORPORATION OF ILLINOIS.

SWITCH-KEY.

1,012,125.

Specification of Letters Patent.

Patented Dec. 19, 1911.

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To all whom it may concern:

Be it known that I, EDWARD B. CRAFT, a citizen of the United States, residing at Hackensack, in the county of Bergen and State of New Jersey, have invented a certain new and useful Improvement in Switch-Keys, of which the following is a full, clear, concise, and exact description.

My invention relates to telephone key construction, and more particularly to the contact springs thereof, and has for its object the provision of a switch key wherein groups of springs may be readily applied to and removed from the frame in a body.

With this end in view, the invention is carried out by forming a plurality of suitably insulated switch springs into a self-contained unit, and securing these units to the frame of the key with their free ends in position to be engaged by operating rollers of the switch-actuating keys.

The utility of this invention lies in the facility with which the units may be applied to the frame in the initial assembly of the key, and when desirable removed therefrom to be replaced by units having different combinations of springs. This interchangeability of the units is very advantageous for other reasons, among which may be mentioned the standardization of certain combinations of switch springs for which there is a steady demand, whereby units made up of these combinations may be carried in stock and supplied to the trade, the user himself readily applying the units in place of those worn out or substituting units having different combinations of springs when the key is to function differently, thus prolonging the life of the key.

Each unit may comprise a plurality of switch springs and intervening strips of insulating material fastened together by transverse screws or other securing members which are anchored in metallic end plates. The individual parts are thus assembled in a compact body which may be applied to the frame of the switch in any suitable manner. Preferably the springs and insulating strips are assembled upon a substantial metallic supporting block which may be screwed or otherwise removably fastened to the frame of the key. A convenient method of mounting units so constructed upon the type of key frame shown, consists in providing a supporting plate for

the units in the form of a rib or bridge piece extending between and fastened to a pair of supports extending downwardly from the top plate. The rib is preferably a flat strip lying in a vertical plane so that a pair of switch spring units may be applied on either side thereof and secured to the rib by a common fastening pin. Two sets of switch springs are thus arranged to present their free ends in position to be actuated by a switch actuating key having two operating rollers side by side.

In the accompanying drawing, Figure 1 is a side elevation showing one of the units in section to illustrate the manner in which the various parts thereof are held together; Fig. 2 is an end elevation taken on line 2—2 of Fig. 1 showing a pair of units and their supporting rib in section, to illustrate the manner in which a pair of units is mounted upon the key frame; Fig. 3 is a sectional view on line 3—3 of Fig. 1 supplementary to Fig. 2; and Fig. 4 is a perspective view of the rib with its supports, and the metallic blocks upon which the various parts composing the unit are mounted.

Like parts are designated by similar reference characters throughout the several views.

The key structure shown comprises a top plate 1 supporting a pair of switch-actuating rocking levers 2, 3. Associated with each lever or key is a supporting frame of inverted U-shape, the downwardly extending arms 4, 4', 5, 5' whereof are united by bridging members or ribs 7, 7', each of which is a flat plate lying in a vertical plane, upon either side whereof the switch spring units are mounted. The unit 6' differs from the unit 6 in the number of its switch springs, but is otherwise similar, and, therefore, the construction of the units will be particularly described by reference to the unit 6' and, for convenience of description, parts of both units 6, 6' which are similar will have common reference characters. The unit 6' comprises a block 8' preferably of metal, upon which are piled on both sides alternately insulating strips 9 and metal tongues 10, the latter forming the switch contact springs, the pile being confined between metallic end plates 11, 12. A pair of bushings 13', 13 extend through aligned openings in the parts comprising the unit, and pins 14, 15 respectively extend

through end plate 11 and into said bushings, their opposite ends having threaded engagement with the end plate 12, thus serving to hold the various parts together, the bushing preventing the pins from short-circuiting the switch springs.

In Fig. 4 is illustrated the precise manner in which a pair of units are mounted upon the rib 7' opposite each other, a construction adapted for the type of key shown, wherein each rocker arm 2, 3 carries a pair of switch-spring-operating sections 16 and 17. In this form of frame, the supporting arms 4, 4' and 5, 5' for the ribs 7, 7' respectively are of flat metal, tapering toward the base. Each rib itself is also of flat metal and has lugs 18, 19 on both sides adapted to extend through perforations in the arms and be clenched thereto to support the rib midway the edges in a vertical plane. To provide a junction between the units and rib that will hold the units against displacement, depressed portions 20, 21 are provided in the upper and lower edges of the rib and the switch-spring supporting-blocks 8, 8' of the units have channels in their inner faces to form lugs 22, 23, 22', 23', adapted to register with these depressed portions. A common screw 24 passes transversely through the blocks and, engaging with threads in block 8, is adapted when tightened to cause the reduced portion of the rib to enter the channel in each block and the lugs of the blocks to overlap the rib at said reduced portion, as clearly shown in Fig. 2, thus obtaining an interlocking arrangement between the rib and units which prevents their displacement and maintains their free ends in operative relation to the actuating rollers 16, 17 of the rocking arm 3.

Having thus described my invention, I claim as new and desire to secure by Letters Patent of the United States:

1. In combination with a switching appliance, a supporting frame having a top plate, downwardly extending supports secured to said top plate, a rib secured to said supports, a plurality of switch springs suitably insulated from each other, means for securing said springs together as a unit, and independent means for attaching said unit to said rib.

2. In combination with a switching appliance, a supporting frame having a top plate, downwardly extending supports secured to said top plate, a metallic rib secured to said supports, a plurality of switch springs suitably insulated from each other, a supporting block therefor, a device for clamping said springs and block together as a unit, and independent means for attaching the supporting block of said unit to said metallic rib.

3. In combination with a switching appliance, a supporting frame having a top plate,

a pair of flat metallic supports extending downwardly from said top plate, a flat metallic rib secured to said supports and lying in a vertical plane, and a plurality of units each composed of a metallic block carrying switch springs insulated from each other, and a common pin for securing a pair of units to said metallic rib.

4. In combination with a switching appliance, a supporting frame, a plurality of units each comprising a metallic block having a plurality of switch springs and interposed insulating strips, a flat metallic rib carried by said frame to lie in a vertical plane, depressions in the upper and lower edges of said rib, projections on said blocks adapted to register with said depressions, and a pin passing through said metallic blocks and rib and adapted to maintain an interlocking engagement of said blocks with said rib.

5. In combination with a switching appliance, a supporting frame of inverted U-shape having downwardly extending flat metallic arms supporting midway their edges a vertical longitudinally extending rib, switch springs, and a pair of blocks on either side of said rib adapted to carry said switch springs in planes transverse to the plane of said rib, and means for securing said blocks to said rib.

6. In combination with a switching appliance, a supporting frame having a top plate, downwardly extending supports secured to said top plate, a metallic rib secured to said supports, a plurality of leaf-springs and interposed insulating strips, a supporting block therefor, a pin securing said springs, strips and block into a unit, and a screw passing through said block and rib at right angles to said pin.

7. In combination with a switching appliance, a supporting frame having a top plate, downwardly extending supports secured to said top plate, a flat rib secured to said supports, a plurality of self-contained units each composed of a plurality of leaf-springs, interposed insulating strips, end plates and a securing pin extending transversely through perforations in said parts and binding said parts together, and means for attaching said units to said flat rib with the springs in planes transverse to that of the rib.

8. In combination with a switching appliance, a supporting frame having a top plate, downwardly extending supports secured to said top plate, a flat metallic rib secured to said supports and lying in a vertical plane, a plurality of units each composed of a plurality of leaf-springs, interposed insulating strips, end plates and securing pins extending transversely through bushings therein and binding said parts together, and means for attaching said units to said flat

rib with the springs in planes transverse to that of the rib.

9. In combination with a switching appliance, a supporting frame, a plurality of units each comprising a metallic block having a plurality of switch springs and interposed insulating strips, a metallic rib carried by said frame, depressions in the edges of said rib, projections on said blocks adapt-

ed to register with said depressions, and means for clamping said interlocking parts together. 10

In witness whereof, I hereunto subscribe my name this 12th day of May A. D., 1910.

EDWARD B. CRAFT.

Witnesses:

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IRVING MACDONALD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."