No. 805,057. PATENTED NOV. 21, 1905.

E. B. CRAFT.

RINGING KEY.

APPLICATION FILED APR. 8, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

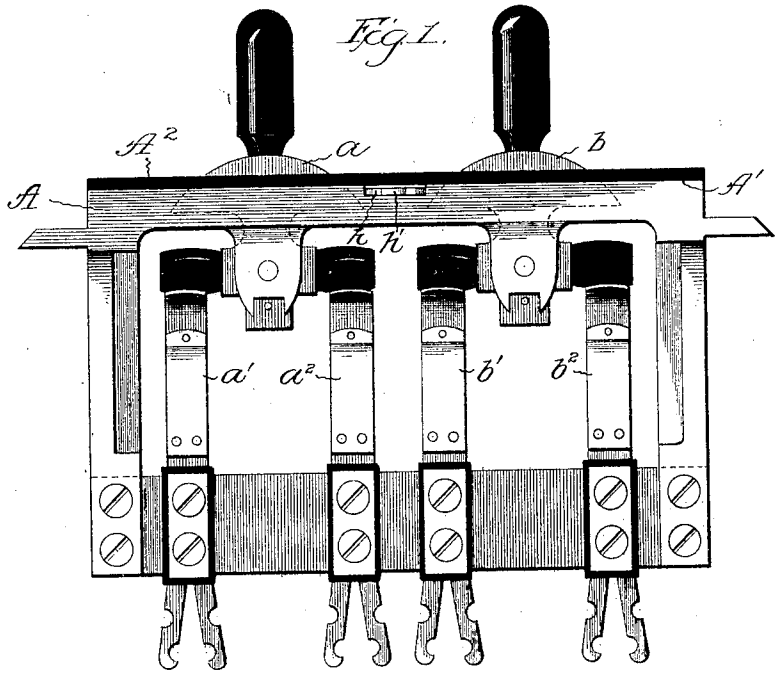


Fig. 2.

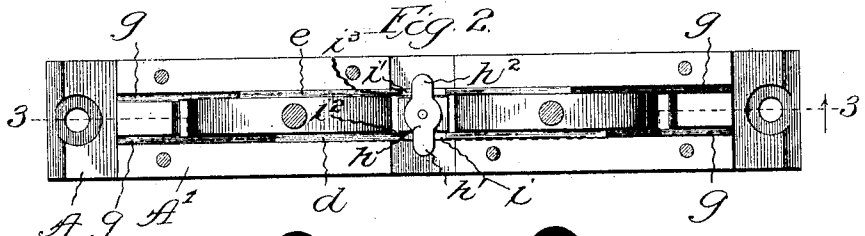
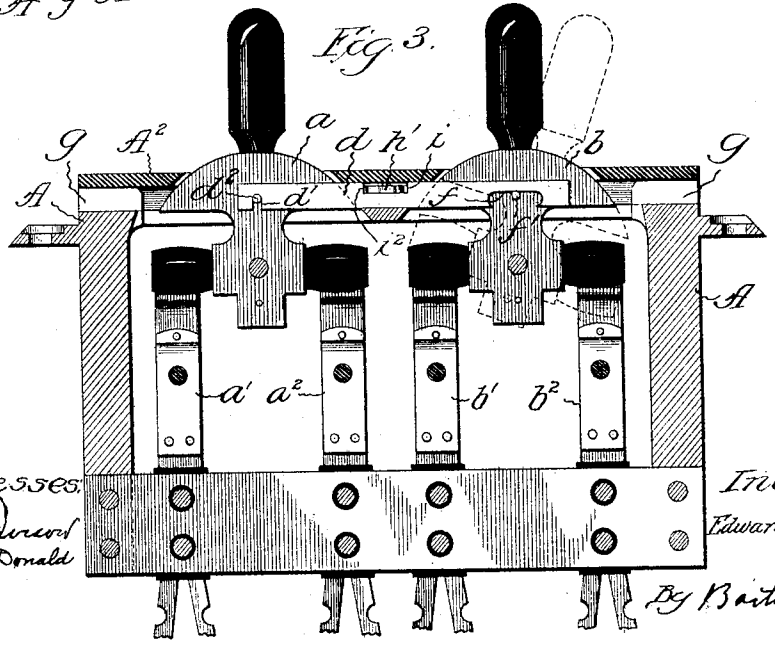


Fig. 3.



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2 SHEETS—SHEET 2.

Fig 4

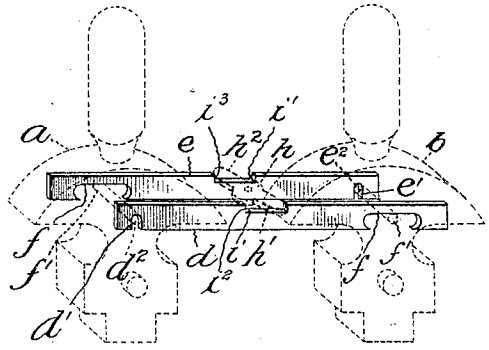
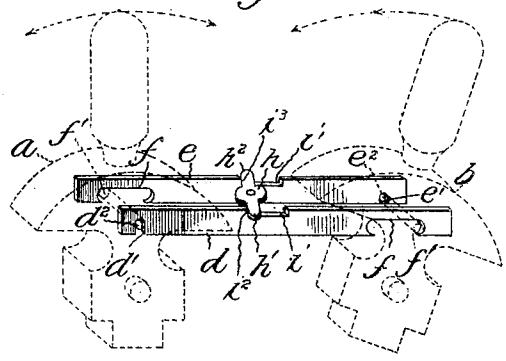


Fig. 5.



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UNITED STATES PATENT OFFICE.

EDWARD B. CRAFT, OF CHICAGO, ILLINOIS, ASSIGNOR TO WESTERN ELECTRIC COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

RINGING-KEY.

No. 805,057. Specification of Letters Patent. Patented Nov. 21, 1905.

Application filed April 8, 1905. Serial No. 254,446.

To all whom it may concern.

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

My invention relates to a switching-key for telephone-exchanges, and has for its object to provide in a key having two switch-levers mounted one before the other an improved, simple, and compact arrangement wherein the manipulation of either one of the switch-controlling levers will restore the other lever to normal position.

I will describe my invention particularly by reference to the accompanying drawings, wherein—

Figure 1 is a side elevation of a switching-key embodying my invention. Fig. 2 is a plan view of said key with the top plate removed. Fig. 3 is a longitudinal sectional view taken on line 3 3 of Fig. 2, and Figs. 4 and 5 are diagrammatic perspective views of the restoring mechanism of the levers of the keys.

The same letters of reference are used to indicate like parts wherever shown.

The switching-key shown is provided with a pair of rocking levers *a b*, pivoted to the frame A of the device and mounted one before the other, such levers being adapted when rocked to actuate sets of switch-springs a' a^2 and b' b^2, respectively, supported by the frame A. The two levers *a b* project above the upper surface A′ of the frame, which is provided with an insulating face-plate A^2 in the usual manner. The levers are connected by links *d e*, each link being connected at one end to one of the levers to move therewith and having lost motion with respect to the other lever or, as shown, a slotted connection with said other lever. As shown, the links *d e* are pivoted to their levers *a b*, being provided with transverse slots d' e', in which pins d^2 e^2 upon the sides of said levers fit tightly. The slotted connection of each link with the lever connected with the other link may consist of a longitudinal slot *f* near the free end of each link, in which a pin *f*′, carried by the lever connected with the other link, is adapted to ride. Said links are mounted on opposite sides of the levers to reciprocate in longitudinal grooves *g g* in the upper portion of the frame. Thus assuming one of the levers to have been rocked in one direction if the other lever is rocked in a certain direction—in the present instance in a direction opposite to the first lever—it operates the links to restore the first-actuated lever to normal position. For example, if lever *b* be rocked to the right, as shown in Fig. 5, the link *e* connected therewith will be moved longitudinally in the same direction until the pin *f*′ upon the other lever rests in the extreme left end of the slot *f* in link *e*. Now when the lever *a* is rocked to the left the pin carried thereby will move the link *e*, connected with lever *b*, to the left and restore the lever *b* to normal position.

I provide a cam *h*, adapted to operate in conjunction with said links, to restore a lever from the actuated position above assumed to its normal position in case the other lever is rocked in a direction opposite to that referred to above. In the present instance if a lever is rocked in either direction to assume either of its actuated positions, if the other lever is subsequently rocked in the same direction, the links and cam will be operated thereby to restore the prior-actuated key. The cam *h* is pivoted to the top of the frame and adapted to engage portions of both links to operate the same, being preferably centrally pivoted and provided with end portions h' h^2, adapted to ride in slots *i i*′ in the links *d e*, respectively, said slots being normally directly opposite each other. If, for example, the lever *a* be rocked to the right, the link *d*, connected therewith, is moved longitudinally in the same direction until the pin *f*′ upon lever *b*, rests in the extreme left-hand end of the slot *f* in link *d*. The slot *i* does not now lie directly opposite the slot *i*′, being shifted to the right, so that the cam occupies an oblique position with its ends h' h^2 in engagement with the left-end walls i^2 i^3 of the slots *i i*′, respectively. If now the lever *b* is rocked to the right, the pin *f*, carried thereby, will ride in the slot *f*′ of link *d* without disturbing the lever *a;* but the link *e*, connected with lever *b*, will be moved to the right and the end wall i^3 of the slot *i*′ therein will engage the end h^2 of cam *h*, rocking the same on its pivot, whereupon the end h' of the cam, being in en-

gagement with the end wall i^2 of slot i of link d, will move the link longitudinally to the left, restoring the lever a to normal position.

A switching device constructed in accordance with my invention, as above described, is simple, compact, and cheap to manufacture, will take up the least amount of space, the pasts thereof are easy to assemble, and access may be easily had thereto for purposes of inspection and repair.

I claim—

1. The combination with a pair of rocking levers, of a link for each lever connected at one end therewith and having a slotted connection with the other lever, each lever when rocked in a given direction operating said links to restore the other lever from an actuated position, and a cam-lever adapted when said lever is rocked in the opposite direction, to be operated thereby in conjunction with said links to restore the other lever from said actuated position.

2. The combination with a pair of rocking levers, of a link for each lever connected at one end therewith, and having a slotted connection with the other lever, and a pivoted cam-lever adapted to engage either link to move the same; whereby either lever when rocked in either direction restores the other lever from either actuated position to normal position through the agency of said links and cam.

3. In a switch-key, the combination with a pair of rocking levers, of switch-springs associated with each lever, a pair of links, each link having a pivotal connection with one lever and a slotted connection with the other lever, and a pivoted cam, surfaces whereof are adapted to engage portions of both links; whereby either lever when rocked in a given direction restores the other lever from an actuated position through the agency of said links, and when rocked in the opposite direction restores said lever from said position through the agency of said links and cam.

4. In a switch-key, the combination with a pair of rocking levers, of switch-springs associated therewith, a pair of reciprocating links connecting said levers, each link being pivoted at one end to one of said levers, and having a longitudinal slot in the other end thereof, a pin carried by each lever adapted to ride in the slot of the link connected with the other lever, and a centrally-pivoted cam between the levers adapted to ride in slots in said links to operate the same; whereby each lever when rocked in a given direction operates said links to restore the other lever from one of its actuated positions, and when rocked in the opposite direction operates said links and cam to restore the actuated lever.

5. In a switching-key, the combination with a frame, of a pair of rocking levers supported thereby, one before the other, and projecting above the upper surface of the frame, switch-springs mounted upon the frame and associated with said levers, a pair of reciprocating links mounted in longitudinal grooves in the upper portion of the frame on either side of said levers, each link being pivoted at one end to one of said levers and having a longitudinal slot near the opposite end thereof, a pin carried by each lever adapted to ride in the slot of the link connected with the other lever, and a centrally-pivoted cam between the levers adapted to ride in slots in said links to operate the same; whereby each key when rocked in a given direction operates said links to restore the other key from one of its actuated positions, and when rocked in the opposite direction operates said links and cam to restore the key from the same actuated position.

6. The combination with a pair of rocking key-levers, of a pair of links extending between said levers, each link being positively connected with one lever and having lost motion with respect to the other lever, and a pivoted lever adapted to engage either link to move the same; whereby either lever when rocked in either direction restores the other lever from an actuated position to normal position.

In witness whereof I hereunto subscribe my name this 10th day of February, A. D. 1905.

EDWARD B. CRAFT.

Witnesses:
F. P. McIntosh,
E. F. Beaubien.