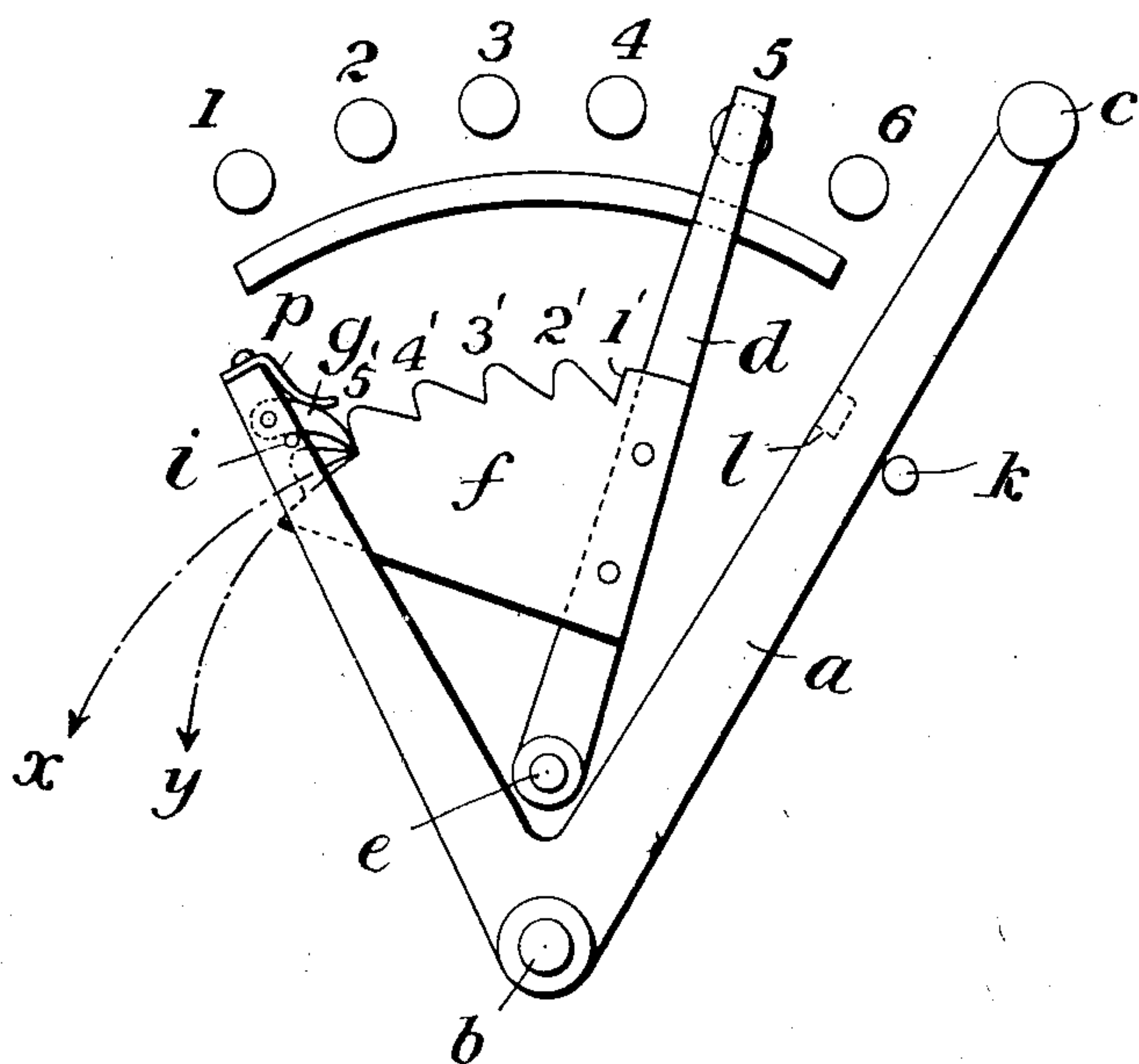


No. 864,899.

C. KRAMER.
STEP SWITCH.

PATENTED SEPT. 3, 1907.

APPLICATION FILED JAN. 16, 1907.



Witnesses

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STEP-SWITCH.

No. 864,899.

Specification of Letters Patent.

Patented Sept. 3, 1907.

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To all whom it may concern:

Be it known that I, CHRISTIAN KRÄMER, a subject of the German Emperor, and a resident of Frankfort-on-the-Main, Germany, have invented certain new and useful Improvements in Step-Switches, of which the following is a specification.

This invention relates to step by step switches and has for its object to provide a switch of such a construction that it will prevent the sudden rush of current due to closing an electric circuit by insuring the gradual cutting out of the resistance of the circuit.

It consists of a construction embodying the general features substantially as herein set forth, arranged and operating as described.

The accompanying drawing illustrates diagrammatically a switch embodying the present invention.

Generally stated, the switch comprises two levers eccentrically mounted with relation to each other and provided with connecting or engaging devices so arranged that in moving the switch lever in one direction it is moved step by step, while in the other direction the levers are moved together so that the resistance may be gradually cut out of circuit by a step by step movement and included in the circuit in a single movement.

In the drawing *a* represents a hand or operating lever shown in the form of an angle pivotally mounted at *b* and having a handle *c* at one end of the lever, and the other end or arm of the lever is provided with a suitable engaging device shown in the form of a pawl *g* normally resting against a stop pin *i* and preferably under the control of a tension spring *p*.

Eccentrically mounted with relation to the operating lever *a* is the contact or switch lever *d*, and this is shown as pivoted on a pin *e* with its free end adapted to bear on the contacts 1 to 6. In the present construction secured to this switch lever is an engaging device in the form of a toothed segment *f* having a series of teeth 1' to 5'. Also connected to the operating lever is an engaging device shown in the form of a projection *l*, and there is a stop pin *k* arranged to limit the movement of the operating lever.

In operating the step by step switch, assuming that the switch lever *d* bears on the contact 1 the operating lever is moved to the left until its pawl *g* engages the tooth 1', for instance, and is then moved to the right to the extent of its movement and this will result in moving the switch lever one step so that it will bear upon the contact 2. The back and forth movement of the operating lever being repeated, the pawl will next engage with the tooth 2', and on the return movement of the operating lever the contact lever will be moved to the next contact 3', and so on. It will be seen that owing to the eccentric relation of the two le-

vers that the pawl will only engage one of the teeth of the segment when the operating handle reaches the latter part of its excursion or movement. When it is desired to move the switch lever in the opposite direction as from the contact 6 to 1, the lug *l* engages the contact lever *d* and both of the levers move simultaneously. It results therefore that the operating lever must be moved to and fro a number of times in order to move the contact lever step by step from its starting to its end position, while in the opposite direction a single movement of the operating lever will move the contact lever from one end position to the other.

The uses and advantages of such a step by step switch will be readily understood by those skilled in the art and it will be understood that while I have illustrated and described a preferred embodiment of the invention it is not limited to the precise details shown, as other equivalent devices may be utilized so long as they operate in substantially the same way to produce the same results.

What I claim is:—

1. A step by step switch comprising an operating lever and a contact lever eccentrically mounted with relation to each other, and engaging devices on the levers whereby the levers are in operative connection only during a portion of the movement of one of the levers in one direction.

2. A step by step switch comprising an operating lever and a contact lever eccentrically mounted with relation to each other, engaging devices on the levers whereby the levers are in operative connection only during a portion of the movement of one of the levers in one direction, and other engaging devices whereby the levers are in operative connections during the whole of the movement of the operating lever in one direction.

3. A step by step switch comprising two levers eccentrically mounted with relation to each other, a catch mounted on one of the levers, a toothed segment mounted on the other lever, and a lug mounted on the first lever, whereby when the operating lever is moved in one direction the contact lever is moved only during a portion of the movement of the operating lever, and when the operating lever is moved in the other direction the two levers move together.

4. A step by step switch comprising an operating lever, a contact lever, means for connecting said levers only during the latter part of the movement of the operating lever in one direction, and means for connecting said levers throughout the movement of the operating lever in the opposite direction.

5. A step by step switch comprising an angular operating lever, a contact lever, means on one arm of the operating lever for engaging the contact lever during a portion of the movement of the operating lever in one direction, and means on the other arm of the operating lever for engaging the contact lever throughout the movement of the operating lever in the opposite direction.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHRISTIAN KRÄMER.

Witnesses:

Fritz SIMON,
Geo. EMMERITZ.