Aug. 23, 1938. H. JUNGHANS 2,127,869

TUMBLER CONTACT

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Fig. 3

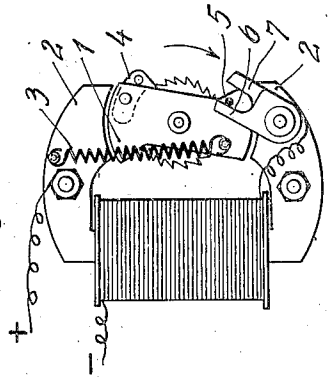


Fig. 2

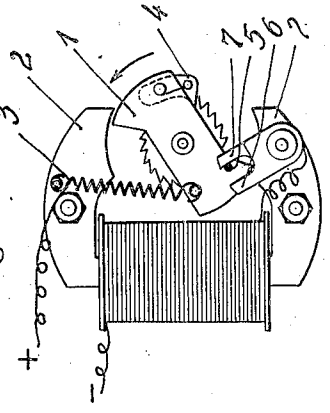


Fig. 7

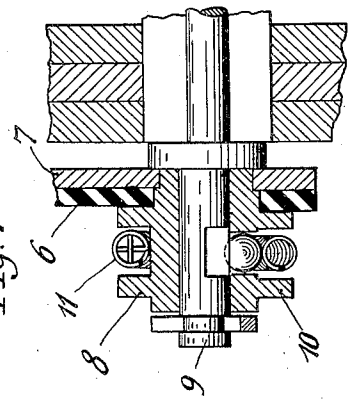
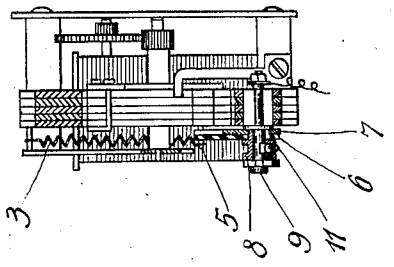


Fig. 1



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Fig.6

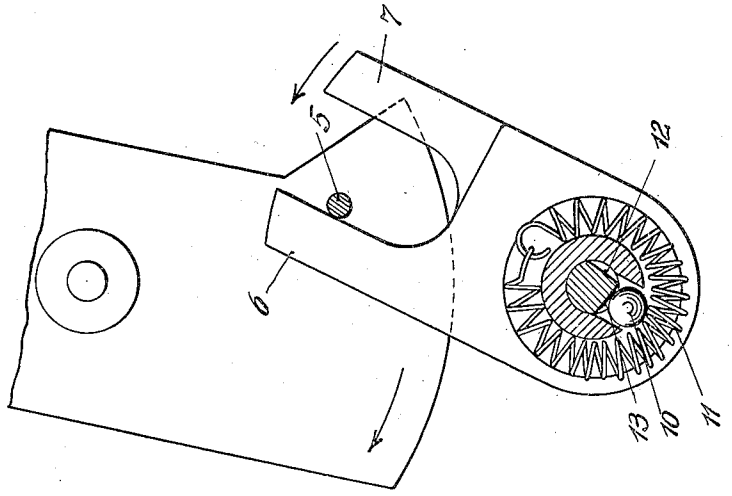


Fig.5

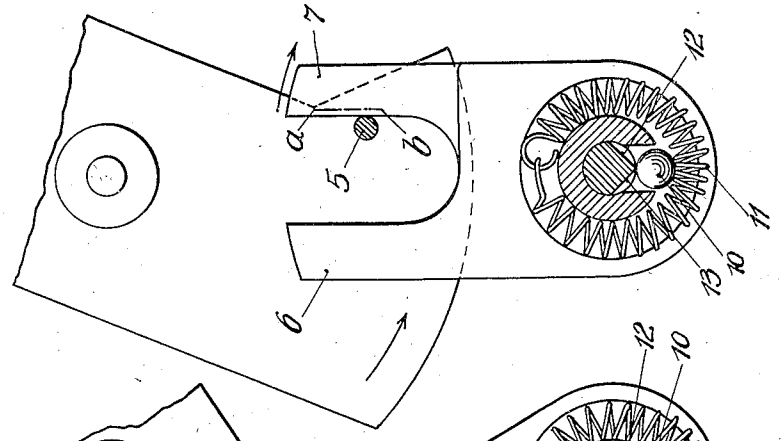
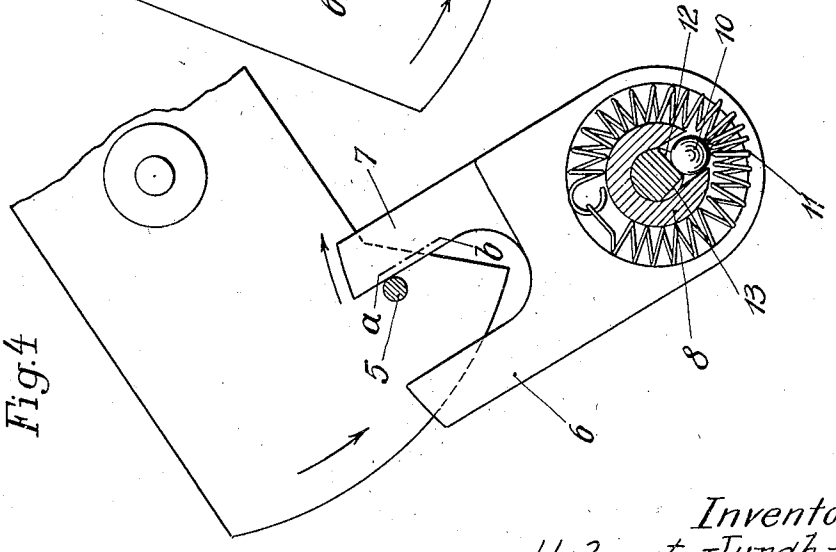


Fig.4



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UNITED STATES PATENT OFFICE

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TUMBLER CONTACT

Helmut Junghans, Eckenhof in Sulgen, near Schramberg, Germany

Application May 4, 1936, Serial No. 77,892
In Germany April 3, 1935

6 Claims. (Cl. 200—86)

There are numerous forms of tumbler contacts in existence which, with the assistance of a spring engaging over the dead point of a lever, serve for the sudden opening or closing of a contact. These known constructions, however, usually call for a plurality of angle members or levers and other intermediate parts, which render the assembly more or less complicated. The attachment of the insulated parts is also frequently accompanied by difficulties.

If now in addition to these disadvantages the space available for the mounting of a contact of this character is very small, as in the case of switch mechanisms, relays, clocks and the like, an arrangement of the kind in question cannot be employed. It is accordingly the object of the invention to provide a particularly simple form of construction in which all of the disadvantages aforesaid are eliminated.

According to the invention, the tumbler contact is disposed centrally about a spindle and is actuated by a contact pin moved by a switch mechanism.

A possible form of embodiment of the construction according to the invention is illustrated in the accompanying drawings, in which

Fig. 1 is a section through the contact arrangement employed in conjunction with an electromagnet with armature.

Fig. 2 shows the commencement of the attraction, the contact being closed.

Fig. 3 illustrates the contact in the open position, the attraction having been completed.

Fig. 4 is a cross-sectional view in the position according to Fig. 1,

Fig. 5 shows the contact immediately prior to the snapping action, and

Fig. 6 is a cross-sectional view in the position according to Fig. 3.

Fig. 7 is a longitudinal section of Fig. 1 on enlarged scale.

Upon completion of the circuit the armature 1 moves out of the position in Fig. 2 into that in Fig. 3 between the two magnet poles 2. By reason of this movement the current is interrupted, and the armature, owing to the force of the spring 3, which acts through the medium of an escapement 4 on a mechanism not shown, is retarded by the latter, i. e., is returned slowly into the position according to Fig. 2. At the end of this movement the circuit is again completed, and the attraction commences anew.

On the armature 1 there is secured a contact pin 5, which engages in a fork or rocking member 6, 7 and assumes the control of the contact. The fork, which consists of two arms 6 and 7 insulated one against the other, is mounted firmly on a bush 8, which is mounted to be rotatable on the spindle 9. The spindle 9 is secured in insulated fashion in the pole 2. In the bush 8 there is provided a radial boring in which there is guided the ball or sliding member 10. This ball is pressed against the faces or flat portions 12 and 13 of the spindle 9 by a helical spring 11 which is disposed about the bush and is made to form a complete ring.

The operation of the device is as follows:

In Fig. 2 the contact 5, 7 has just been closed in the manner described later. The armature is attracted, whereby the contact pin 5, with simultaneous rotation of the fork, wipes along the arm 7. At the same time the ball 10 is moved by the bush 8 (Fig. 4) and passes over the surface 12 up to the edge between 12 and 13. Upon advancing beyond the highest point (Fig. 5) the ball moves over the face 13 under the action of the spring 11 and takes the fork with it. By reason of this slipping action the contact 5, 7 is interrupted with sudden movement, and the insulated arm 6 of the fork moves against the contact pin 5 (Fig. 6), which in the meantime has assumed with the armature the position according to Fig. 3.

The current is now interrupted, and the contact pin 5 on the armature 1 is returned slowly by the spring 3, which also actuates the mechanism aforesaid. The contact pin now wipes along the insulated arm 6 and again actuates the fork in the manner described but in the opposite direction.

When the ball advances beyond its highest point on to the face 12, the arm 7 strikes upon the snapping action against the contact pin, and it accordingly again completes the circuit. By reason of the current now supplied the armature is attracted and the operation is repeated anew.

It is to be particularly observed that the contact is closed at *a* and opened at *b* on the arm 7, i. e., that a wiping movement is performed.

What I claim as new and desire to secure by Letters Patent is:

1. In a device of the character described, a spindle having a pair of flat portions thereon with an axially disposed dividing edge therebetween, a bush mounted on the said spindle and having a radial bore, a rocking member mounted to rock on the said spindle, said bush and rocking member being secured to each other, at least one ball in the said bore of the bush, and a helical spring surrounding the said bush to form a com-

plete ring and pressing the said ball resiliently against the said flat portions on the spindle.

2. In a device of the character described, a spindle having a pair of flat portions thereon with an axially disposed dividing edge therebetween, a rocking member having means in which the member rocks on the spindle and the means having a radial slot therein forming a bore, at least one ball in said bore, and a helical spring surrounding said means to form a complete ring and pressing the ball resiliently against the said flat portions on the spindle.

3. In a device of the character described, a spindle having a pair of flat portions with an axially disposed dividing edge, a rocking member mounted to rock on the said spindle and consisting of contact arms insulated from each other, a contact pin co-operating with the said arms, a bush mounted on the said spindle and having a radial bore, said arms and bush being secured to each other, a sliding member in the said bore adapted to move over the said flat portions, and a helical spring surrounding the said bush to form a complete ring and pressing the said sliding member resiliently against the said face portions.

4. A switch mechanism comprising a spindle having a pair of flat portions thereon with an axially disposed dividing edge therebetween, a rocking member mounted on the spindle and consisting of one arm of electric conducting material and a second arm of non-electric conducting material, the two arms being mounted on the spindle in spaced radial relation relative to each other, a contact pin adapted to oscillate between and contact the two arms, a bush on the spindle and having a sliding member therein to cooperate and contact the flat portions, the arms and bush being secured to each other, and a spring for forcing the sliding member constantly against the flat portions and the dividing edge.

5. A device according to claim 3, in which the contact pin is mounted to oscillate back and forth and is composed of a current conducting material to conduct current from one of the contact arms.

6. A switch according to claim 4, in which the spring surrounds the bush.

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