(No Model.)

A. LÜNGEN.

CIRCUIT CLOSING CONTACT FOR DOORS.

No. 303,579. Patented Aug. 12, 1884.

Fig. 1.

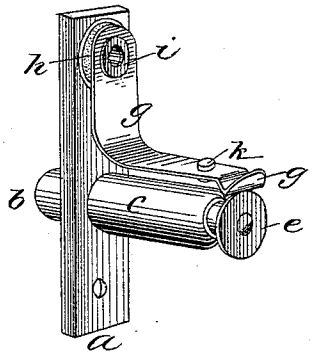


Fig. 3.

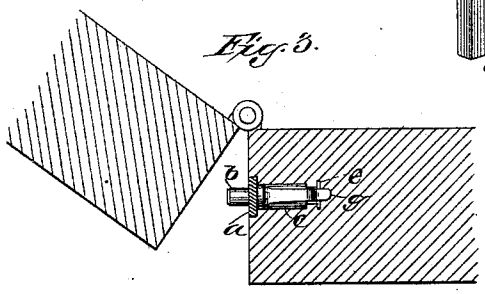


Fig. 4.

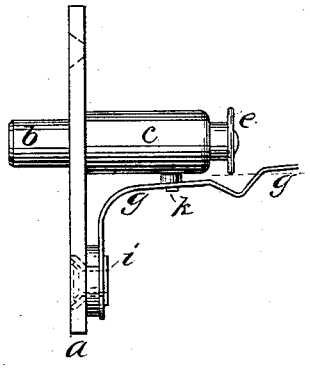
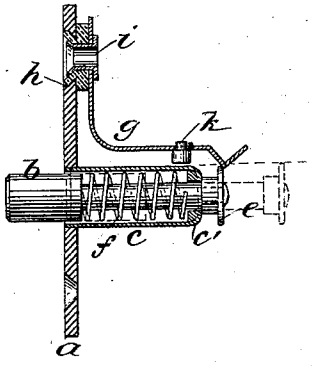


Fig. 2.



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ADAM LÜNGEN, OF NEW YORK, N. Y.

CIRCUIT-CLOSING CONTACT FOR DOORS.

SPECIFICATION forming part of Letters Patent No. 303,579, dated August 12, 1884.

Application filed June 7, 1883. (No model.)

To all whom it may concern:

Be it known that I, ADAM LÜNGEN, of New York city, New York, have invented certain new and useful Improvements in Circuit-Closing Contacts for Doors, &c., of which the following is a specification.

My invention applies to that class of electrical contact devices employed in burglar-alarm circuits, more especially to such as are adapted to be applied to doors, whereby the opening or closing of the door will close or open the circuit, and thus sound the alarm.

My invention aims to furnish a door-contact which will embody a simple and durable construction and produce a long scraping contact when its terminals are forced together, thus insuring perfect electrical action; and the invention may be briefly described to consist partly in the combination, with a sliding bolt forming one terminal of the contact, of a contact-spring disposed parallel with the bolt and bent at the tip to engage with the bolt when projected toward it.

The improvement also lies in certain details of construction, as hereinafter set forth.

In the drawings annexed, Figure 1 presents a perspective view of my improved door-contact viewed from the rear side. Fig. 2 is a vertical section thereof. Fig. 3 is a fragmentary view of a door, showing the position in which the contact device is applied. Fig. 4 is a side elevation, illustrating a modification.

The device shown in Figs. 1 and 2 is adapted to be used on "open circuits," and the bolt is shown projected with the terminals in contact, closing the circuit, such as occurs when the door is opened, as in Fig. 3. A slight change in construction, however, adapts the device for close circuits, as shown in Fig. 4, in which the bolt is also shown projected; but the terminals are out of contact in this position and the circuit open.

Referring to Figs. 1 and 2, *a* indicates the base-plate of the device, which is stamped from thick sheet-brass. This plate is bored with a countersunk screw-hole at each end, one being much larger than the other, and at or near the middle it is perforated with a large round hole, in which is expanded or riveted one end of a brass tube or sleeve, *c*, which projects from the back of the plate. The forward edge of the tube is flush with the front face of the base-plate, while its back edge is crimped or swaged inwardly around a washer, *c'*, so as to form a contracted opening, as fully shown in Figs. 1 and 2. Now, within the tube is fitted a sliding bolt, *d*, which is preferably formed from a short length of round brass rod, its forward and protruding end being a free fit for the bore of the tube *c*, from the mouth of which it normally protrudes beyond the front of the base-plate, while the rear portion of the bolt is reduced in diameter, forming a guiding-stem which protrudes through the contracted rear end of the tube *c*, and on this end is riveted a flanged disk or head, *e*. Around the stem of the bolt, within the tube, is placed a spiral spring, *f*, which bears at one end against the shoulder at the head of the bolt, and at the other end against the contracted end of the tube, thus tending to constantly project the head of the bolt from the tube, as seen in Figs. 1 and 2, and thus bringing the flanged head *e* up close against the end of the tube, which limits the projection of the bolt.

On the back of the base-plate is mounted the contact-spring *g*, which is preferably of L shape, with its vertical member attached to the back of the base-plate, while its horizontal member, forming the free end of the spring, is disposed parallel with the line of the bolt alongside of the tube *c*, and is terminated with a sharp V-bend, which projects in the path of the flanged head *e*, so as to engage with the same when the bolt is moved to or fro. The contact-spring *g* is attached firmly to the base-plate, yet insulated therefrom by means of the insulating-eyelet *h*, which is embedded in the larger countersunk hole in the base-plate, the insulating-eyelet *h* and spring being both held firmly to the plate by means of the inner metallic eyelet, *i*, which contacts with the spring but not with the base-plate. The bolt *b* is, however, always in metallic connection with the plate, so that one of the screws which fasten the device in the door-frame will be in metallic connection with the base-plate, and hence with the bolt, while the other screw will be in metallic connection with the eyelet *i*, and therefore with the spring *g*; hence the respective circuit-wires connect with said screws, or, what is the same, with the base-plate *a* and the eyelet *i*, so that hence

when the bolt is fully projected, as seen in Figs. 1 and 2, the head *e* of the bolt will be in contact with the bent tip of the spring *g*, and hence the circuit will be closed, while if the bolt is depressed within its tube the contact-head *e* will recede from the bent tip of the spring *g*, as indicated by dotted lines in Fig. 2, and thus break the circuit. As the bolt thus recedes from the spring the latter will spring laterally toward it, so that the apex of its V-shaped bend will be in the path of motion of the flanged head *e*. In order to limit this lateral approach of the spring toward the bolt, an insulating stop or stud, *k*, fixed in the spring, will seat on the tube *c*, and thus form a stop which will limit the movement of the spring and prevent its making contact except with the flange of the bolt *e*, as will be readily understood.

In applying this contact device to the door it is mortised into the edge of the door-frame beneath the hinged edge of the door in the well-known manner, as indicated in Fig. 3, so that when the door is shut the bolt becomes forced into its tube and the circuit is broken, as indicated by dotted lines in Fig. 2, while if the door be opened even slightly the bolt will be allowed to spring out to its full extent, and the contact-head *e* will contact with the contact-spring *g*, and thus close the circuit and sound the alarm.

It may be observed, referring to Figs. 1 and 2, that the contact-points of the device are so formed and disposed that in the act of making contact the narrow edge of the head *e* will approach the inclined tip of the spring *g* and ride against the same in a wedging manner, thus flexing the spring laterally and making a prolonged scraping contact on a small surface, which insures a perfect electrical action. The parts are preferably so arranged that when the bolt is fully projected the angle of the bend in the tip of the spring will just spring over the rounded periphery of the contact-flange *e* and bear firmly on the same, as seen in Fig. 2, as this produces a better frictional action between the parts and insures cleaner contact.

It will be further noted that, as the contact-flange *e* is circular and narrow on its periphery and the tip of the spring flat, the flange makes contact on a very small surface, and the entire pressure of the spring is concentrated on this surface, so that a sharp scraping action occurs at each make and break of contact, insuring a clean metallic surface at the contacts, and preventing all "glaze" and "oxide," which would impair a perfect connection. The mechanical and electrical action of this contact device is therefore found to be very simple and efficient, and its construction is cheap and durable.

The flanged contact-head *e* is made of a wrought-brass disk or washer, and hence may be made quite thin, and will yet possess great strength and durability to endure constant sharp contacts on its narrow edge with the spring without breaking or wearing rapidly, which would be likely to occur with a cast-metal flange.

From what has been already described it may therefore be noted that all the metallic parts of this device are formed of wrought metal—the base *a*, the tube *c*, bolt *b*, and head *e*, as well as the several springs—and by the described construction and arrangement of parts the finished device is rendered very strong, light, and durable, and its manufacture is rendered cheap and simple, which form important practical advantages in addition to the electrical and mechanical advantages before noted.

To adapt this device for close circuit-work, it is only necessary to form the contact-spring a little longer and with a reverse bend, as seen in Fig. 4, the construction being otherwise precisely the same. In this case it will be seen that when the door is opened and the bolt fully projected the contact-head *e* will lie opposite to the entering bend in the spring, and will thus be out of contact, whereas when the door is closed and the bolt depressed the contact-head will ride over the bent tip of the spring, and thus contact therewith and close the circuit, as indicated by dotted lines in Fig. 4.

It is obvious that the insulating-stop *k* may be fixed on the tube *c*, instead of the spring *g*, if preferred, and that other slight modifications may be made without affecting the general plan of the device.

What I claim is—

The combination, with the metal plate *a*, of the guide-tube *c*, expanded or riveted into the same, and the bolt *b* and spring *f*, with the contact-flange *e* and contact-spring *g*, arranged and constructed substantially as and for the purpose set forth.

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