No. 619,034. Patented Feb. 7, 1899.

# O. R. CLINE.

## SWITCH HANDLE FOR TELEPHONE CALLS.

(Application filed Aug. 8, 1898.)

(No Model.)

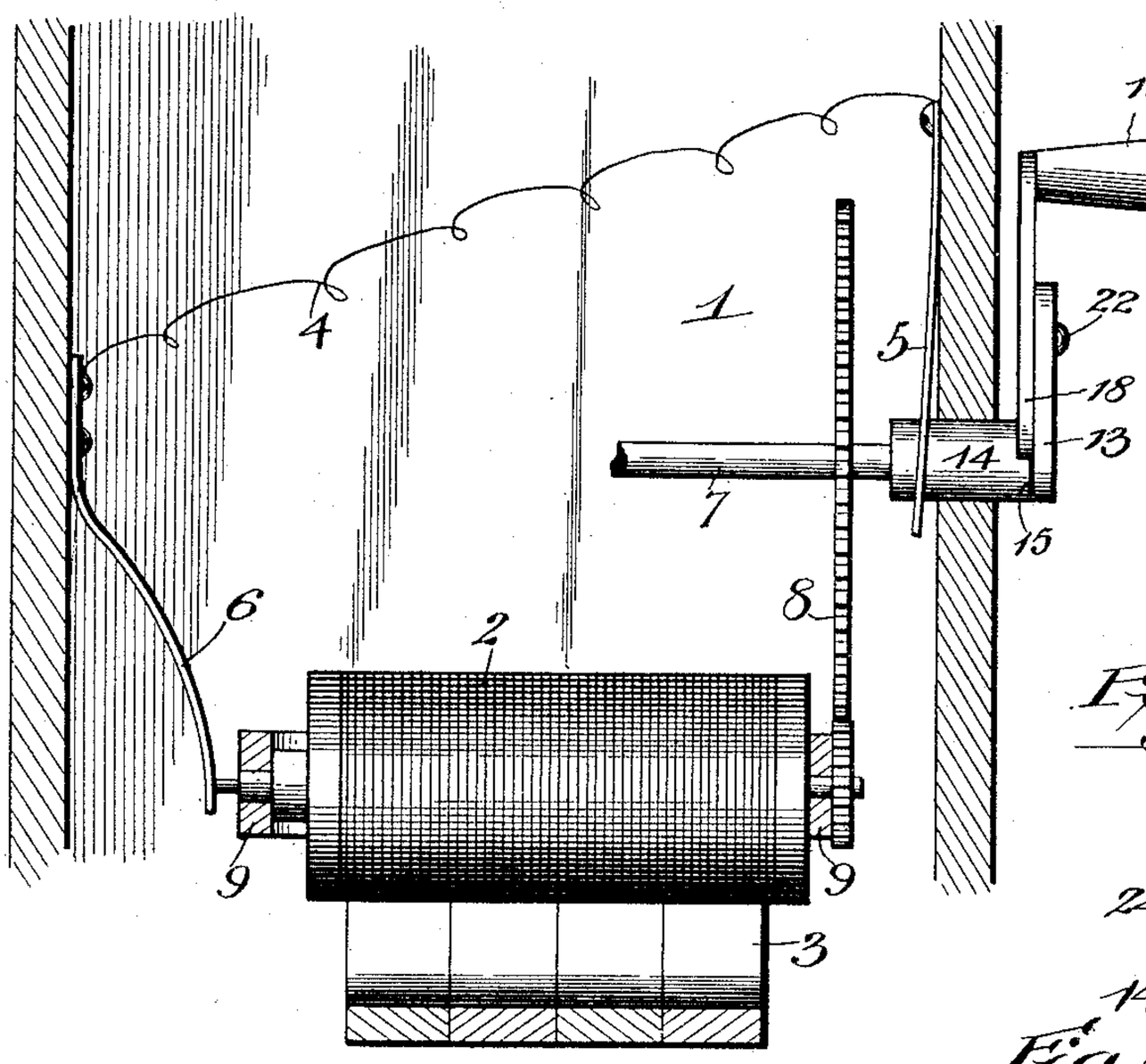


Fig. 1.

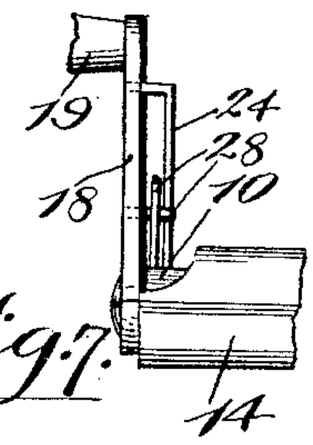


Fig. 7.

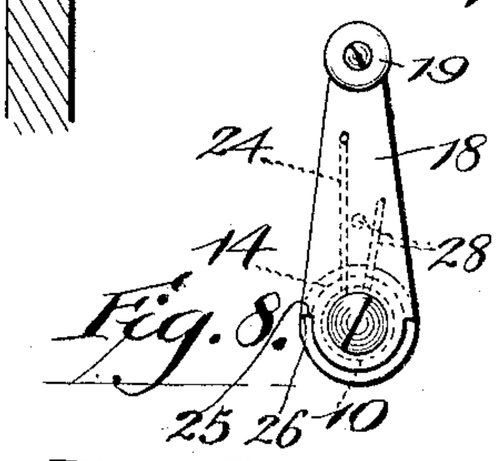


Fig. 8.

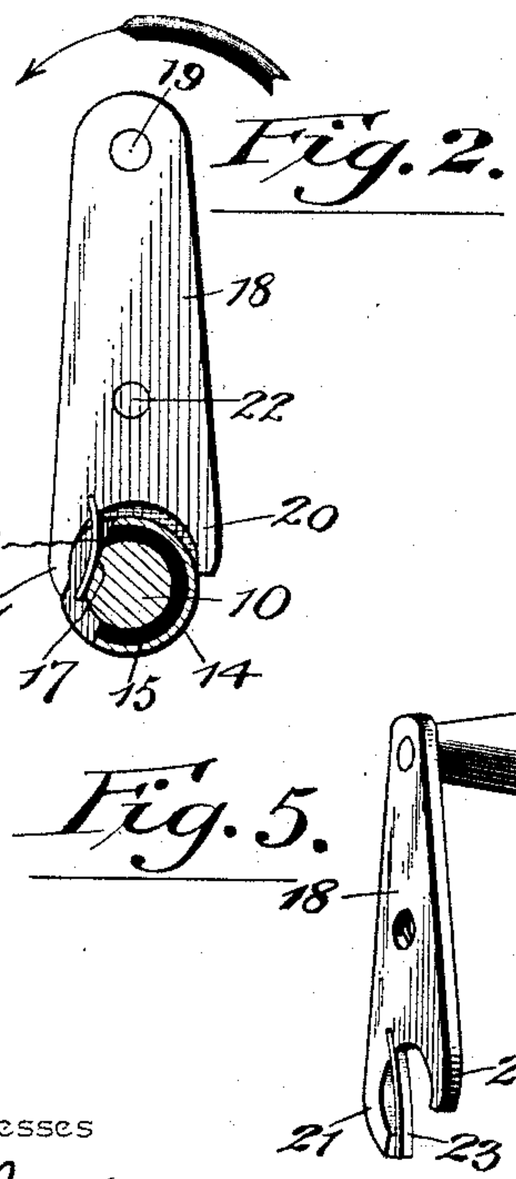


Fig. 2.

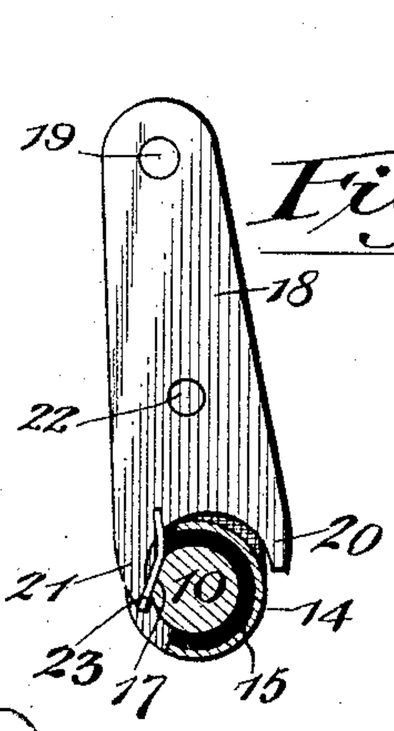


Fig. 3.

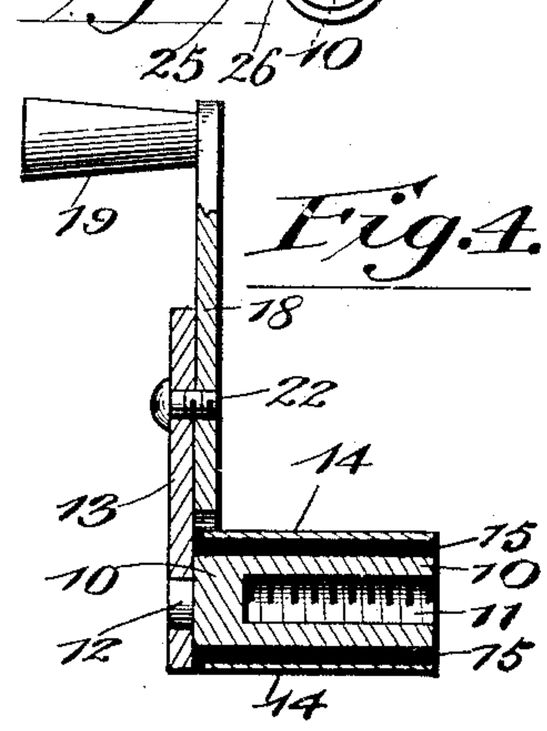


Fig. 4.




Fig. 5.

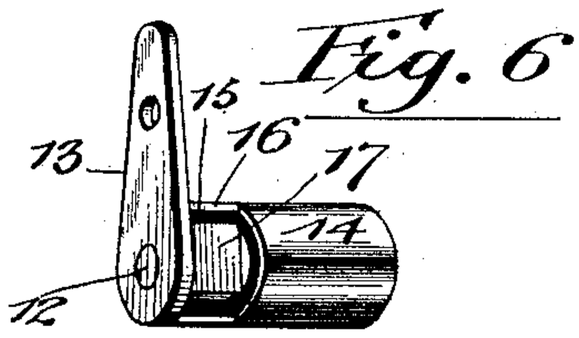


Fig. 6

Witnesses
A. Roy Appleman
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Cashow & Co.

# UNITED STATES PATENT OFFICE.

OREN R. CLINE, OF EL DORADO, KANSAS, ASSIGNOR TO L. SANDS, OF CLEVELAND, OHIO.

## SWITCH-HANDLE FOR TELEPHONE-CALLS.

SPECIFICATION forming part of Letters Patent No. 619,034, dated February 7, 1899.

Application filed August 8, 1898. Serial No. 688,047. (No model.)

*To all whom it may concern:*

Be it known that I, OREN R. CLINE, a citizen of the United States, residing at El Dorado, in the county of Butler and State of Kansas, have invented a new and useful Switch-Handle for Telephone-Calls, of which the following is a specification.

My invention relates to switch-handles for operating the magneto-calls for telephone apparatus, in which it is desirable to provide a means which will operate to shunt or short-circuit the coils of a rotary armature forming a part of the magneto-generator when the latter is at rest or not in service, but on the rotation of the operating-crank this short circuit is broken and the armature-coils of the generator are cut into and maintained in the calling-circuit.

A rotary switch-handle for use in a magneto-call apparatus should be as nearly automatic as possible—that is to say, to break the shunt-circuit of the armature-coils as the crank is rotated and to establish the shunt or short circuit as said crank comes to a period of rest—and such handle should be capable of easy application to telephone apparatus generally. While devices answering this general description are not new, broadly, in the art, I aim to provide an improved construction in which the insulated parts of the switch-handle are united solidly and firmly to insure positive action both mechanically and electrically, and the insulation of my improved handle is housed between the metallic elements thereof to prevent said insulation from bearing any appreciable strain when the handle is in service. Hence the important element of the insulation is securely protected against wear and injury in the practical service of the improved switch-handle.

The invention consists of a switch-handle for telephone apparatus comprising an attaching-bushing, a sleeve arranged exteriorly to the bushing and insulated electrically therefrom, a crank-handle connected electrically with the bushing and movable relatively to the insulated sleeve, and a contact in a short circuit of the armature-coils engaging electrically with the insulated sleeve.

To enable others to understand the invention, I have illustrated the preferred embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a sectional elevation of part of the telephone-box and the armature of a magneto-call apparatus, showing my improved handle in operative relation to said parts. Fig. 2 is a sectional elevation taken on a plane transversely through the bushing and sleeve with the crank-handle in its normal position. Fig. 3 is a view similar to Fig. 2, with the crank-handle in the position it assumes when rotated by hand. Fig. 4 is a vertical longitudinal sectional view through the crank-handle of my invention in its entirety. Fig. 5 is a detail perspective view of the arm and handle forming the operating-crank. Fig. 6 is a detail perspective view of the sleeve and the connected parts. Figs. 7 and 8 are side and end views of another embodiment of the invention in which the crank-handle is fitted directly to the bushing.

Like numerals of reference denote like and corresponding parts in each of the several figures of the drawings.

A portion of a telephone-box for an ordinary telephone apparatus is indicated by the numeral 1, and the rotary armature and the permanent magnets of a magneto-call apparatus are indicated by the numerals 2 and 3, respectively. 4 indicates a conductor, and 5 a contact-spring, forming parts of a shunt-circuit for the coils of the rotary armature, and this armature is arranged to be driven by a crank-handle from a shaft 7, which is geared at 8 to the armature. All these elements with the exception of the contact-spring 5 are ordinary in the art, and hence they may be of the usual or any preferred contsruction.

One of the parts of my improved switch-handle is a bushing 10, which is made of metal and is fastened electrically to the shaft 7, by which the armature is driven. This metallic bushing 10 is constructed for easy application to the magneto-call apparatus of a telephone by providing said sleeve with an internally-threaded socket 11, thus adapting the bushing to be screwed fast on a threaded end of the shaft 7. At one end the bushing is provided with a stem or tenon 12, and to

said stem is firmly secured an arm 13, which lies substantially at right angles to the bushing and enables the crank to be mounted readily upon the bushing. The bushing is surrounded by a contact-sleeve 14, which is exposed, so that the spring 5 may rest or bear directly thereon, and this contact-sleeve and the bushing are firmly and solidly joined together, but are insulated electrically from each other by the insulation 15. This insulation is interposed between the bushing and the contact-sleeve, so as to bind the parts firmly in fixed relation to each other and insure rotation thereof, and said insulation is thus housed within the contact-sleeve and around the attaching-bushing, whereby the insulation is protected by the metallic elements from wear and injury. The end of the sleeve 14 contiguous to the offstanding arm 13 of the metallic bushing is provided with a notch 16, and through this notched part of the sleeve 14 passes the closed end of the bushing. The part of the bushing where it is exposed through the notched end of the sleeve is flattened or cut away at 17 to provide a seat and contact for the crank and its spring, and this bearing-face 17 of the bushing is thoroughly insulated by the insulation from the sleeve, the insulation also filling the narrow space that exists between the arm 13 and the end of the sleeve contiguous to the arm.

18 is the crank, which is bifurcated at one end to embrace the notched parts of the sleeve and bushing. This crank is provided with a handle 19, and the end thereof opposite to the handle is bifurcated to provide the forks or prongs 20 21. The recessed end of the crank is arranged to straddle the notched portions of the sleeve and the bushing, and thus one fork 20 is adapted in the normal position of the handle to make electrical contact with the sleeve 14, while in the opposite position of the handle the other fork or prong 21 is arranged to bear upon the face 17 of the bushing. This crank 18 is pivoted to the arm 13 at a point between the bifurcated end of said crank and the handle 19, the pivotal attachment of the crank to the arm 13 being effected by a screw or rivet 22. The crank 18 is held normally in a position where its fork or prong 20 is in contact with the sleeve by any suitable form of spring 23, which is attached to the crank so as to lie on the notched face 17 of the bushing, and this spring is firmly secured to the crank in a suitable way.

The spring 5 is in constant contact with the sleeve 14, and in the normal position of the crank when the magneto-call apparatus is not in service the spring 23 holds the fork 20 in contact with said sleeve 14, while the other prong or fork 21 is always free from the sleeve. With the parts in these positions the short or shunt circuit is established for the armature-coils as follows: through conductors 6 and 4, spring 5, sleeve 14, crank-fork 20, arm 13, and bushing 10 to generator, or from one terminal of armature-winding to the other, as above indicated. To operate the magneto-call and send the signal over the line, the operator turns the crank 18 in the direction indicated by the arrow in Fig. 2, thereby overcoming the tension of the spring 23 and moving the crank on its pivotal connection with the arm 13 to withdraw the prong or arm 20 from contact with the sleeve 14, thereby breaking the shunt-circuit and cutting the armature into the line. It will be observed that the continued rotation of the crank breaks the shunt and keeps the armature of the magneto-call in the circuit, but the instant that the rotation of the crank ceases the spring 23 reacts to return the crank to its normal position and again establish the short circuit.

My improved switch-crank may be easily attached to the magneto-call of any ordinary telephone apparatus, because it is only necessary to screw the bushing to the operating-shaft. The forked crank and the spring are arranged to secure very little lost motion between the crank and contact-sleeve, and all the parts of the improved switch-crank are joined substantially together to insure positive mechanical and electrical contact. The insulation is thoroughly housed and protected by the metallic elements of the crank-handle, and such insulation is not exposed to wear and friction by movable parts acting thereon.

In one modification of my invention the crank-arm 18 may be attached directly and made movable on tenon 12, as shown by Figs. 7 and 8, and arm 13 dispensed with. In this case contact between arm 18 and sleeve 14 would be sustained by a suitably-applied spring 24, as shown, and the operation would be substantially the same as in the construction herein presented.

As represented by Fig. 7, the lower end of the crank-arm is pivotally fitted on the tenon of the bushing to be confined in place by the headed screw, and the arm and sleeve are normally in electrical contact in a manner equivalent to the forked end of the arm and the sleeve shown by Figs. 1 to 6, inclusive—that is to say, the arm at its inner end has a shoulder 25, which rests against a shoulder 26 on the sleeve, formed at the notched end thereof. This contact between the sleeve and the pivoted arm is normally effected by a spring 24, which presses against the arm in order to make the short circuit for the armature-coils; but to complete the calling-circuit for the telephone apparatus the arm and the bushing are connected in a manner equivalent to the device shown by Figs. 1 to 6—that is to say, the arm and sleeve have contacts 28, which normally are separated when the arm is pressed by the spring into engagement with the sleeve, but which contacts make electrical connection when the crank is turned on its pivot to operate the telephone-call.

Changes may be made in the form of some of the parts, while their essential features are retained and the spirit of the invention em-

bodied. Hence I do not desire to be limited to the precise form of all the parts as shown, reserving the right to vary therefrom.

Having thus described the invention, what I claim is—

1. An operating-crank for magneto-calls consisting of a bushing, a contact-sleeve united firmly to said bushing and insulated electrically therefrom, and a spring-controlled crank mounted movably upon the bushing and normally engaging with the sleeve, substantially as described.

2. An operating-crank for magneto-calls comprising a bushing, a contact-sleeve surrounding the bushing, insulation interposed between the bushing and sleeve and uniting the parts solidly together, a forked crank pivotally supported on the bushing, and a spring which holds one of the crank-forks normally in contact with the sleeve, substantially as described.

3. An operating-crank for magneto-calls comprising a bushing, a contact-sleeve insulated from and joined rigidly to said bushing, a crank mounted movably on the bushing, and a circuit-contact in engagement with the sleeve, substantially as described.

4. An operating-crank for magneto-calls comprising a bushing, a notched sleeve surrounding the bushing and united firmly thereto by intermediate insulation, an arm supported by the bushing, a crank pivoted on said arm and having the forked end which embraces the sleeve, and a spring engaging with the crank to normally hold one of the forks thereof in engagement with said sleeve, substantially as described.

5. An operating-crank for magneto-calls comprising a bushing having a recessed face forming a bearing, a notched sleeve insulated from and united firmly to the bushing, an arm fixed to the bushing, a crank pivoted to said arm and having a forked end which embraces the sleeve, a spring seated on said bearing-face of the bushing and acting against the crank to normally hold one fork thereof in contact with the sleeve, and a circuit contact-spring in engagement with the sleeve, substantially as described.

6. An operating-crank for magneto-calls, comprising a bushing, a sleeve insulated therefrom, a forked crank mounted on the bushing, a spring engaging with the forked arm to normally hold one of the forks thereof in contact with the sleeve, and a contact-spring resting on the sleeve, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

OREN R. CLINE.

Witnesses:

LAFE KNOWLES,

ARTIE PEFFLEY.