(No Model.) 2 Sheets—Sheet 1.

J. W. SEE & J. J. McMAKEN.

Telephone Toll System and Apparatus.

No. 240,853. **Patented May 3, 1881.**

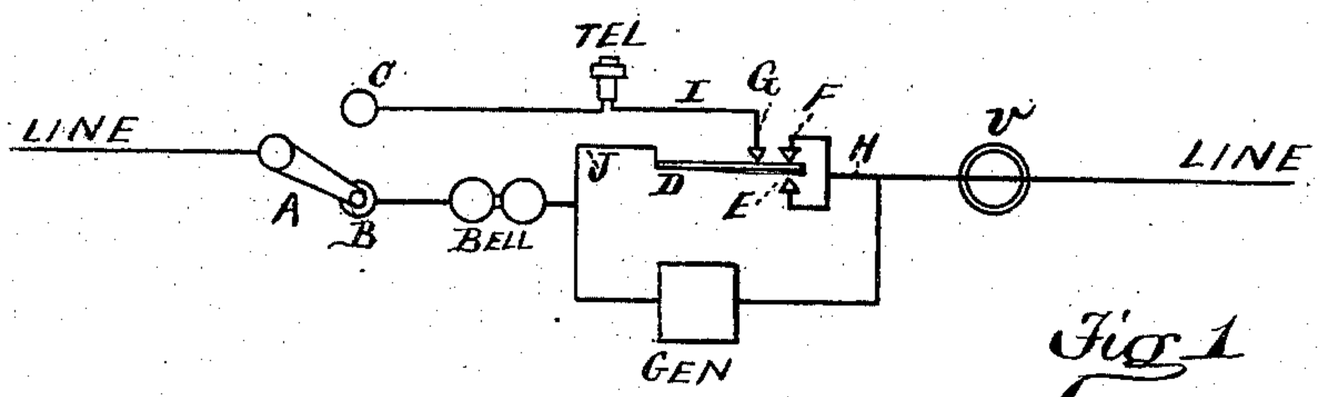

Fig 1

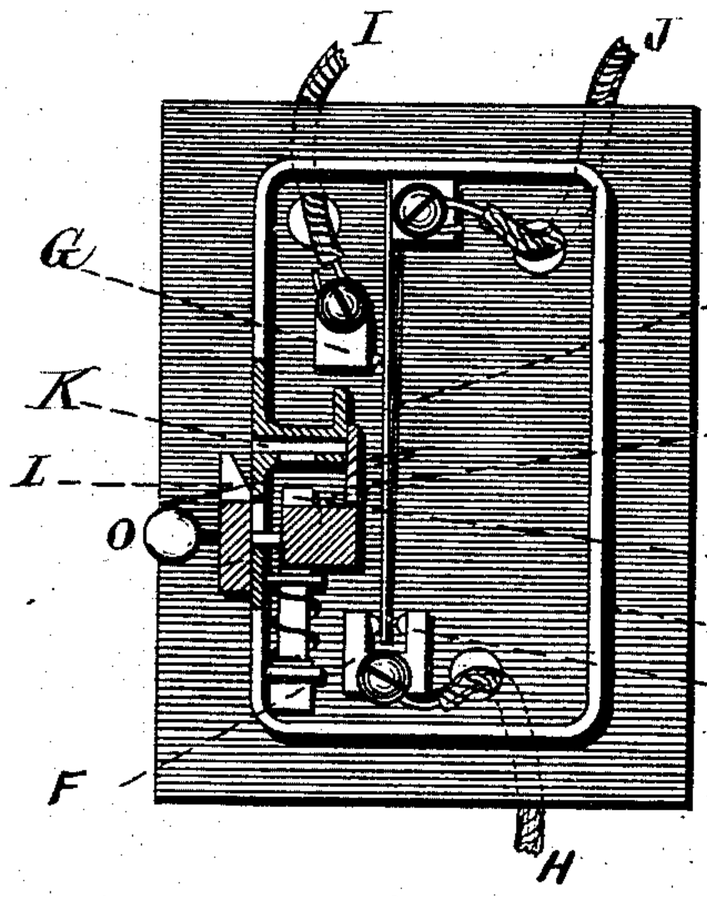

Fig 2

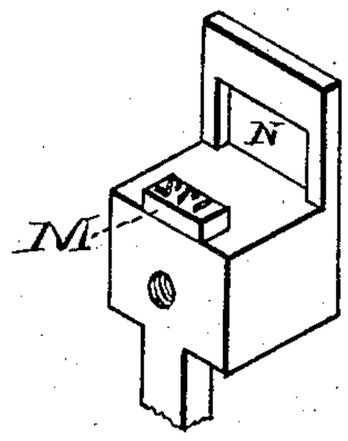

Fig 3

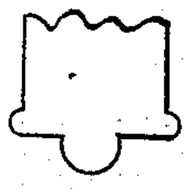

Fig 4

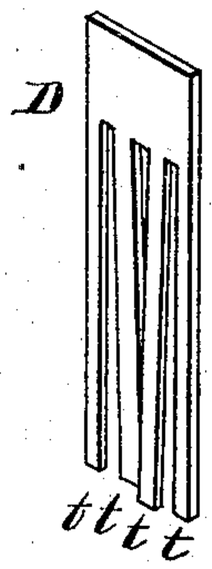

Fig 5

WITNESSES:
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W. A. Tangeman

James W. See
Joseph J. McMaken
INVENTORS

(No Model.)

2 Sheets—Sheet 2.

J. W. SEE & J. J. McMAKEN.

Telephone Toll System and Apparatus.

No. 240,853. **Patented May 3, 1881.**

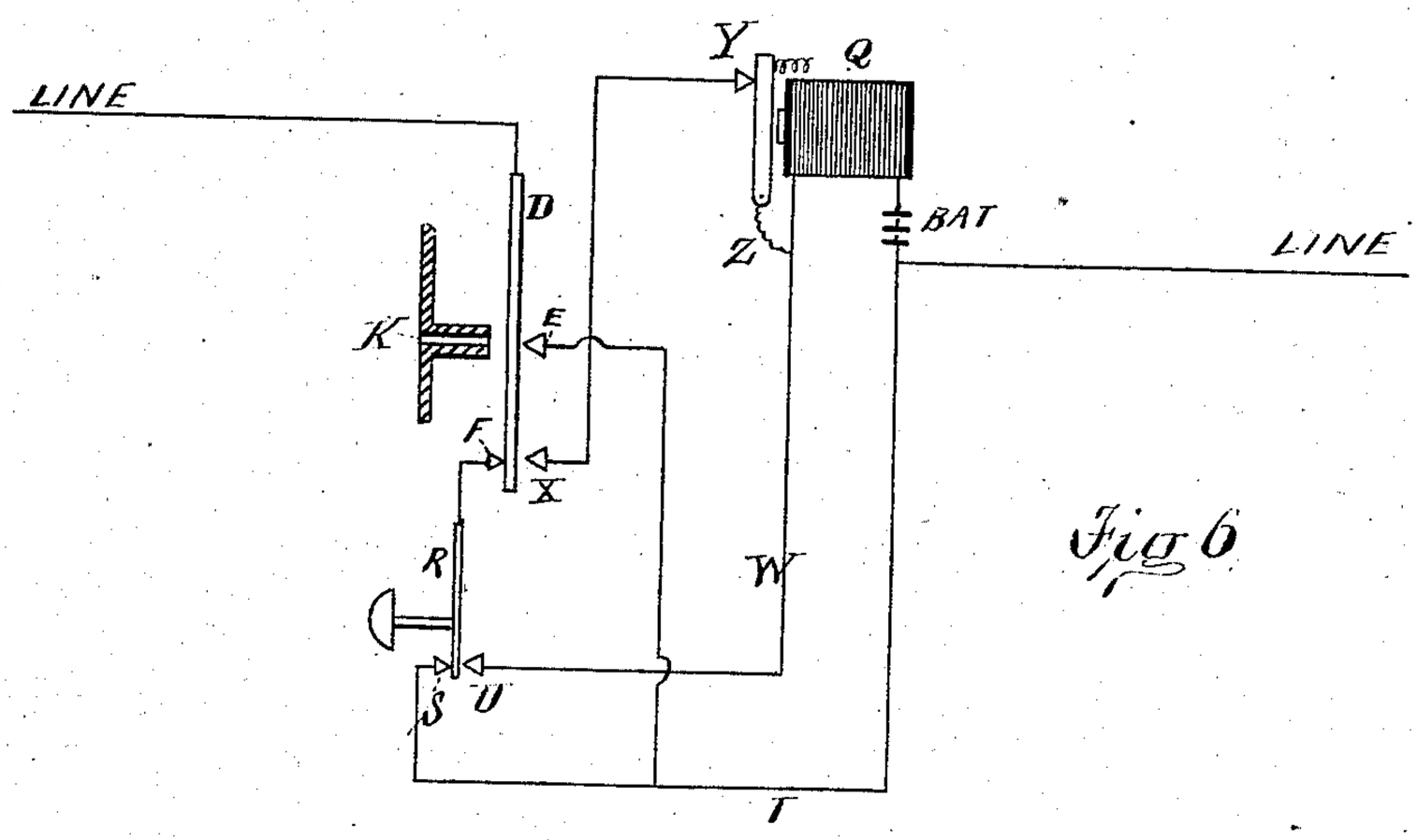

Fig 6

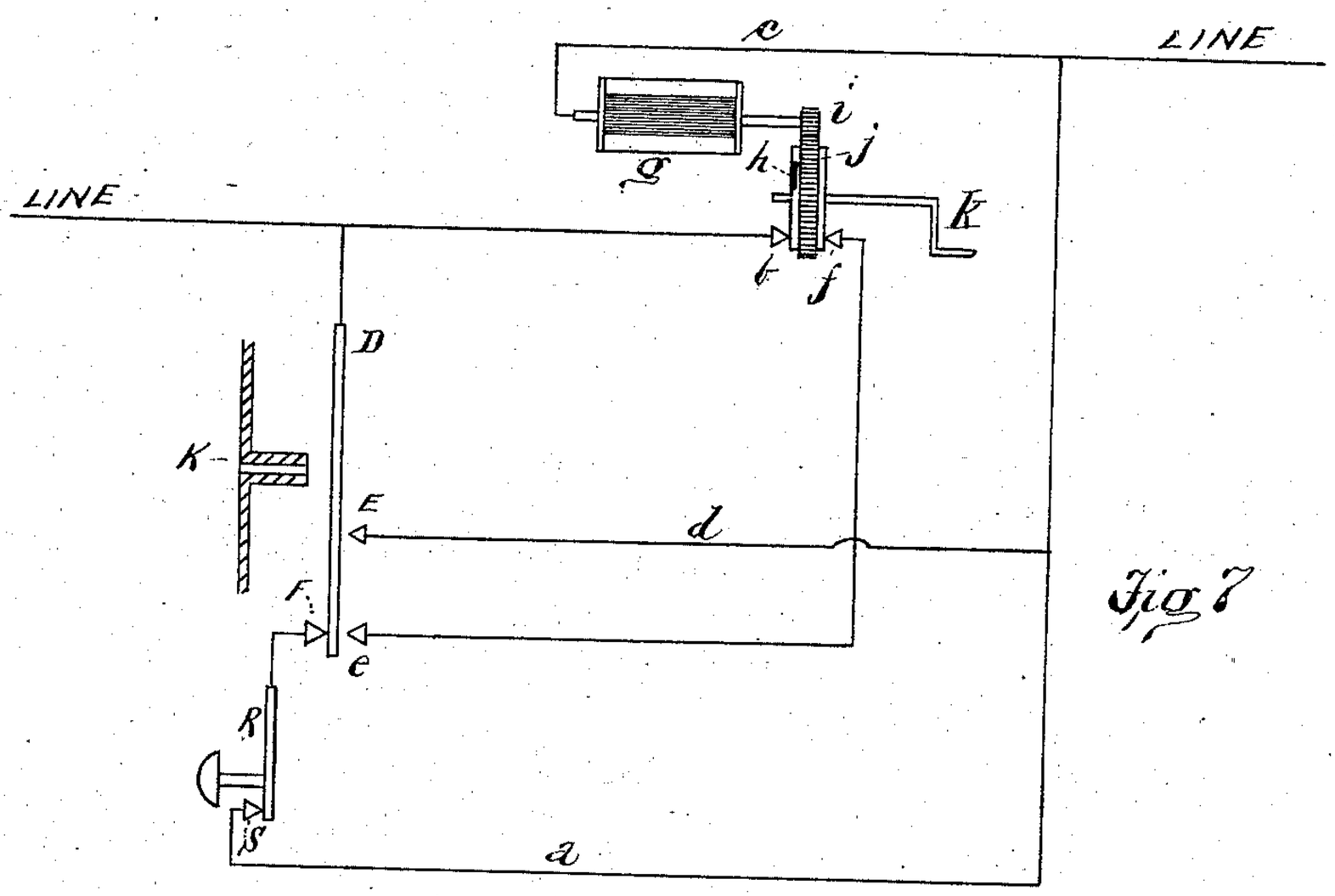

Fig 7

WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES W. SEE AND JOSEPH J. McMAKEN, OF HAMILTON, OHIO, ASSIGNORS TO THE YALE LOCK MANUFACTURING COMPANY, OF STAMFORD, CONN.

TELEPHONE TOLL SYSTEM AND APPARATUS.

SPECIFICATION forming part of Letters Patent No. 240,853, dated May 3, 1881.

Application filed February 26, 1881. (No model.)

To all whom it may concern:

Be it known that we, JAMES W. SEE and JOSEPH J. MCMAKEN, of Hamilton, Butler county, Ohio, have invented certain new and useful Improvements in Telephone Toll Systems and Apparatus, of which the following is a specification.

Letters Patent No. 237,327, granted February 1, 1881, to James W. See exhibit a telephone toll system in which the call device becomes operative only upon the presentation of a proper key. The object is set forth in that patent.

The present invention is based upon the object, and presents a means by which the ticket-keys described in the patent referred to above may have impressed upon them some device to indicate at which station they were used. The income of a certain station can thus be ascertained by inspecting the consumed tickets.

In the present invention the call devices are, as in the patent referred to, rendered inoperative in the absence of a proper key. The key may be an ordinary key, to be used by authority, or it may be a ticket to be absorbed by the lock or mutilated by the device, so as to be incapable of further use, as herein set forth.

In the accompanying drawings, Figure 1 is a diagram of circuits at a station, illustrating the utility and action of our plan and devices. Fig. 2 is an interior view of a form of lock involved; Fig. 3, a perspective view of the ticket marker and mutilator. Fig. 4 is plan of ticket or key. Fig. 5 is a perspective view of the tumbler-switch. Figs. 6 and 7 exhibit applications of our system to differing conditions.

In Fig. 1 it will be seen that the generator, without regard to its character, is incapable of sending currents to line, owing to short-circuiting across H J. If the switch-spring D be slightly depressed, contact F will open, the short circuit will be broken, and the generator will become operative on the line. If the spring D be depressed too much, it will contact at E, and the short circuit will be restored. To render the spring D useful, it must be maintained between the contacts E and F while the generator is being used. If the spring D be made in comb-form, as shown in Fig. 5, with each tooth having a different position, it is obvious that great delicacy will be required to set all the teeth so that they will not contact with either E or F. The teeth *t* of such a switch are similar to lock-tumblers, and we adapt such a switch to be operated by a key, and we term such a switch a "key-tumbler switch." Any form of switch which requires the presentation of a key we term a "lock-switch."

In Fig. 2 is shown a switch of the key-tumbler kind. P is the case, which should securely inclose the switch, to prevent improper access to it. J and H are wires constituting parts of a circuit, as referred to in Fig. 1. D is the tumbler-switch. The proper presentation to the tumblers of any proper key will set it so as to open the contact F without closing it at E.

Fig. 4 shows a flat form of key, made, say, of card-board. Its warded upper end is adapted to properly set the tumbler-switch when inserted in the key-slot K. Such a key may be used as often as desired as the lock has thus been described, and such a key and lock form a guard against the unauthorized use of circuits.

The lock may, if desired, be arranged upon the key-absorbing system mentioned in the patent above referred to.

We show in this a device for so mutilating the key as to unfit it for further use, and at the same time stamping upon it the number of the station at which it was used.

The inner part of the key-slot K is covered by a guard, N, which may be raised by the knob O. The lower edge of this guard is a shear.

M is a type or stamp, which, upon the lifting of the knob O, impresses into the key in the slot such number or other device as may be upon it. The parts are clearly shown in Fig. 3.

L is a beveled bolt moving with the knob O. It covers the front of the ticket-slot when the guard N uncovers the inner part, and its bevel is so arranged as to properly adjust the key, which is inserted before it is lifted.

It will be readily seen that the knob O must

be lifted to admit the key, and that the type M will impress the key, and that upon the descent of the knob the guard N will shear the front of the key off. The sheared fragment may fall into the lower part of the case, or it may fall out through perforations in the case-bottom. The contacts in such a lock-switch may, of course, be arranged to have any desired effect on any circuit. The impression plan and the mutilation plan may be used in connection with the system described in the patent above referred to.

In Fig. 1 it will be seen that the telephone-circuit G I G cannot be used unless the switch D is in normal position. If the spring D were kept locked open, the telephone-circuit would be open at G. Such an arrangement guards against the use of a key permanently left in the lock.

In Fig. 1, *v* may be a generator capable of sending to line effects different and distinguishable from the effects of the main generator. It is unlocked and free for use for its purpose—that of answering calls and "ringing off."

In Fig. 6 the normal circuit is through D T. The finger-spring R can be used to put circuit through U W and the battery, and thus send battery impulses to the line for answering and ringing off.

D is a tumbler-switch, which, properly set by key at K, puts circuit through contact X, rheotome Y Z Q, and battery, and thus sends vibrating impulses to line for calling purposes. Wrong setting of D makes contact at E and short-circuits battery. This plan of having two distinctive signals—one free and one locked—may be varied considerably without departing from the principle.

In Fig. 7, *g* is the armature of a rotary magneto-generator, *i* and *j* being its multiplying gearing, and *k* its crank. The right-hand line connects with the armature, as usual, by the wire C. The left line connects by brushing-contact *b*. The surface on which *b* brushes has a non-conducting spot, *h*, which, in the rotation of the mechanism, tends to break the circuit and interrupt the signal periodically.

It will be seen that the generator-circuit is normally short-cut through D F R S *a*, so that the generator cannot send current to line. The finger-key spring R allows this short cut to be broken at any time at S, thus permitting the periodically-broken generator-current to be put to line at will for the purpose of answering and ringing off. A proper key, acting on the lock-switch D, will open F, thus breaking the short cut, and will put circuit through *e* and contact *f*, which brushes on a surface not having an insulating-spot, like *h*. This allows continuous call to be sent to line. Wrong adjustment of tumbler-switch D will close contact E and make a new short cut through *d*.

We claim as our invention—

1. In telephone toll systems, the combination, with a telephone-line, of a signal-current generator, a lock-switch adapted to permit proper control of the signal-current, and a case, or equivalent guard, adapted to prevent the manipulation of said switch without a proper key, substantially as and for the purpose specified.

2. In telephone toll systems, an electrical signal-current generator, a lock-switch, and a periodical circuit-breaker, combined and arranged, in appropriate circuits, to operate substantially as and for the purpose specified.

3. In telephone toll systems, the combination, with a telephone-line and a calling device, of a key-mutilator and a lock adapted to prevent improper use of the calling device, and to be operated by a destructible key, substantially as and for the purpose specified.

4. In telephone toll systems, the combination, with a locked signal device, and a lock for said signal device adapted to be operated by an impressible key, of a key-marker adapted to impress the key upon its presentation to the lock, substantially as and for the purpose specified.

5. In telephone toll systems, the combination, on a telephone-line, of an electrical-signal generator, a locked calling-switch, and an unlocked switch, arranged in appropriate circuits to operate substantially as and for the purpose specified.

6. In lock-switches, the combination, with a movable switch-piece adapted to be manipulated by means of a key, of a case, or equivalent guard, to prevent improper manipulation of said switch-piece, and having an aperture for the insertion of a key, substantially as and for the purpose specified.

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J. J. McMAKEN.

Witnesses:
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