

J. A. McCOY.
TELEPHONE CIRCUIT.

No. 278,351.

Patented May 29, 1883.

Fig:2.

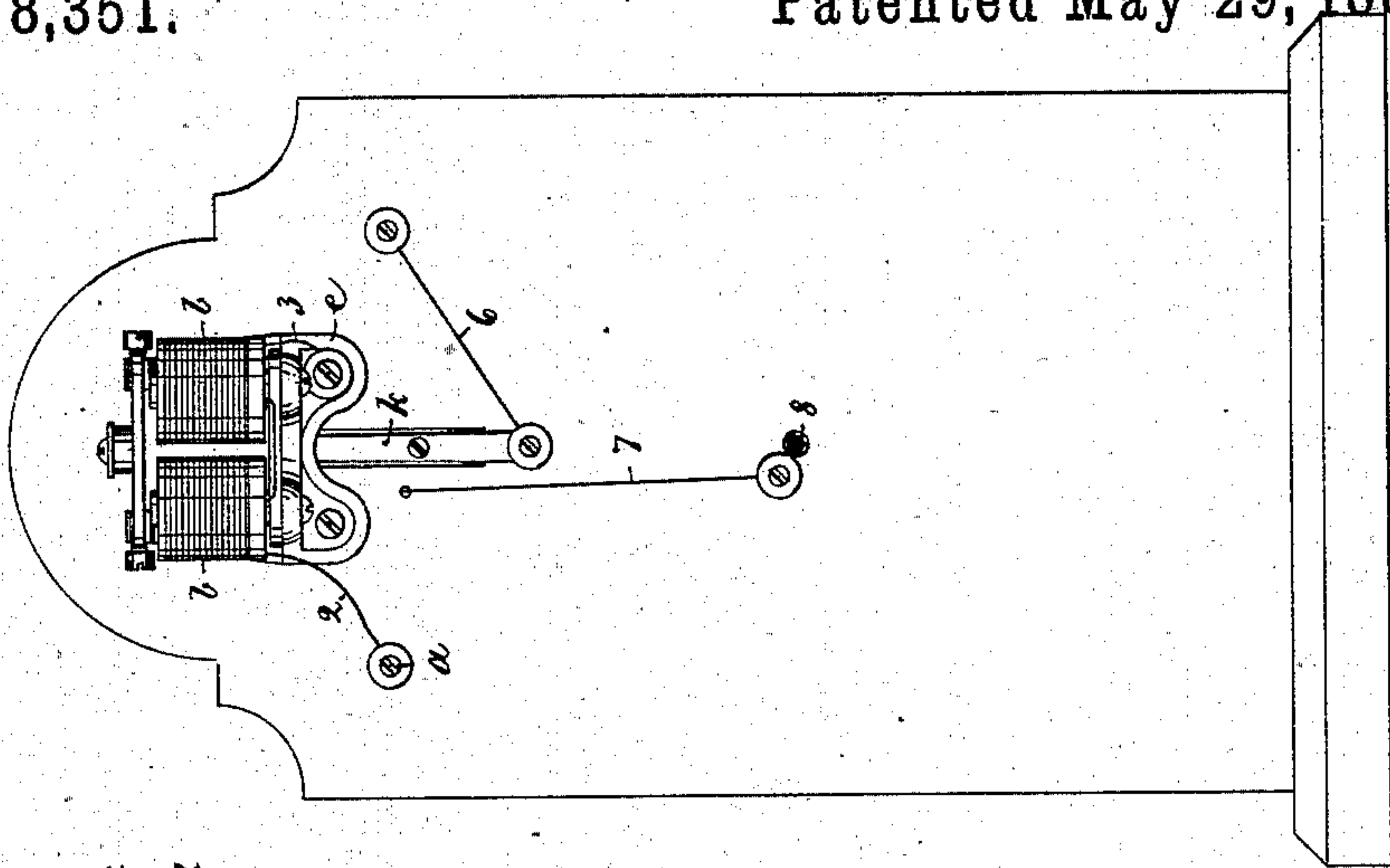


Fig:3.

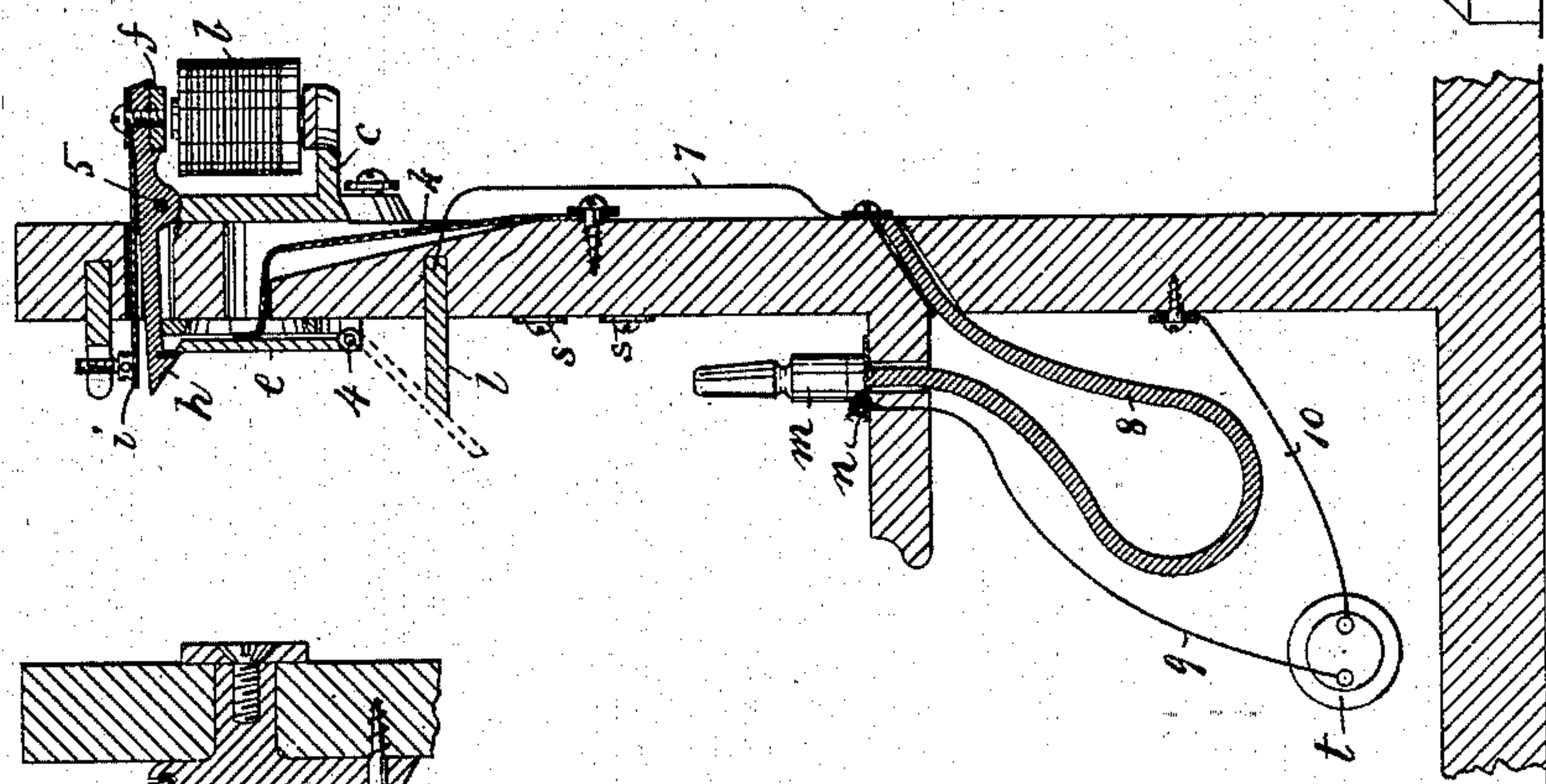


Fig:4.

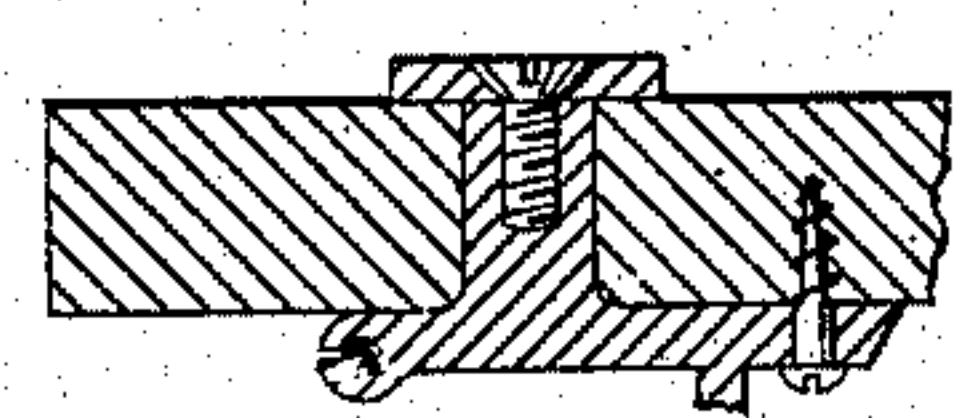
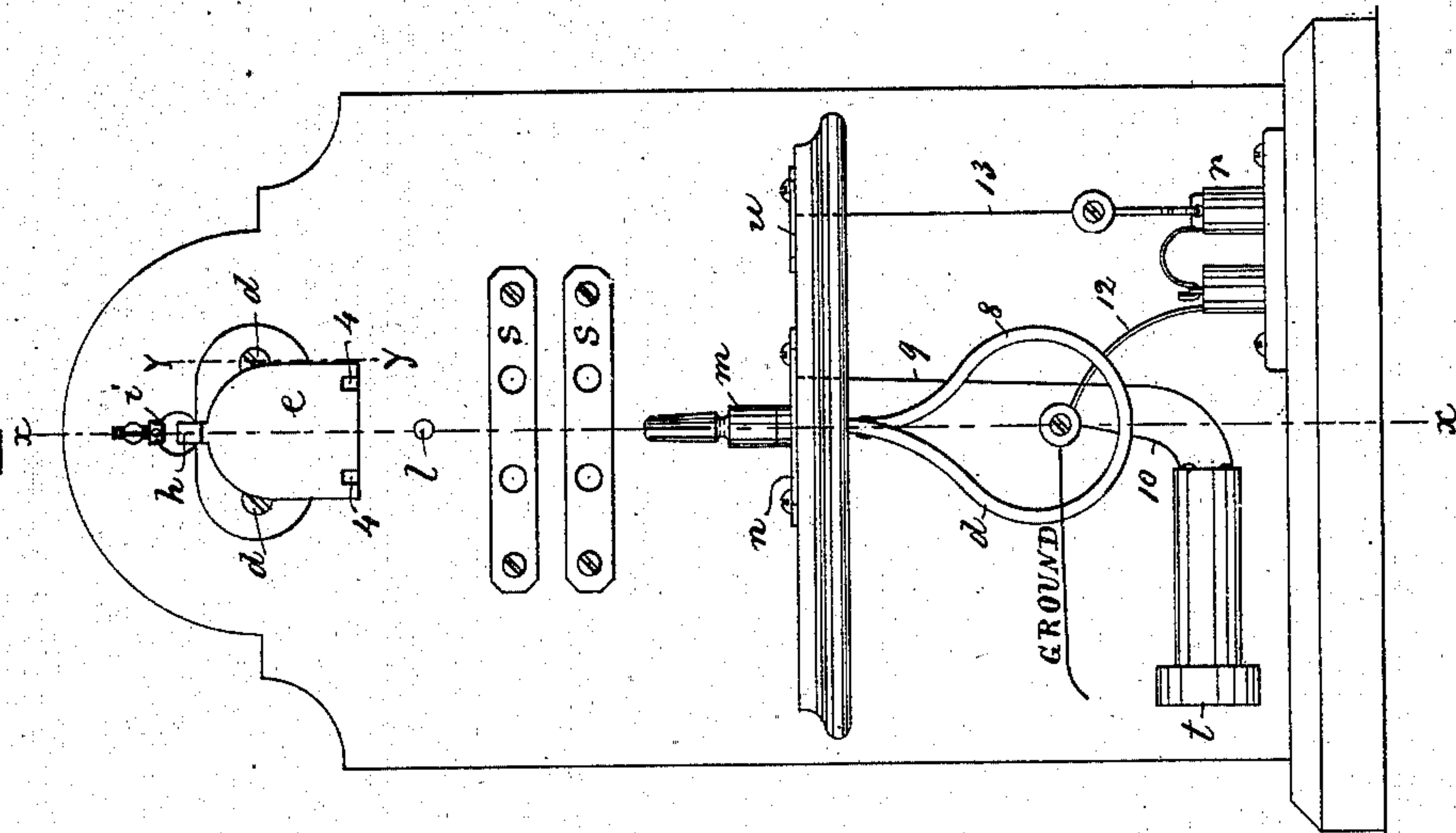


Fig:1.



Witnesses.
Jos. P. Suermore
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(No Model.)

2 Sheets—Sheet 2.

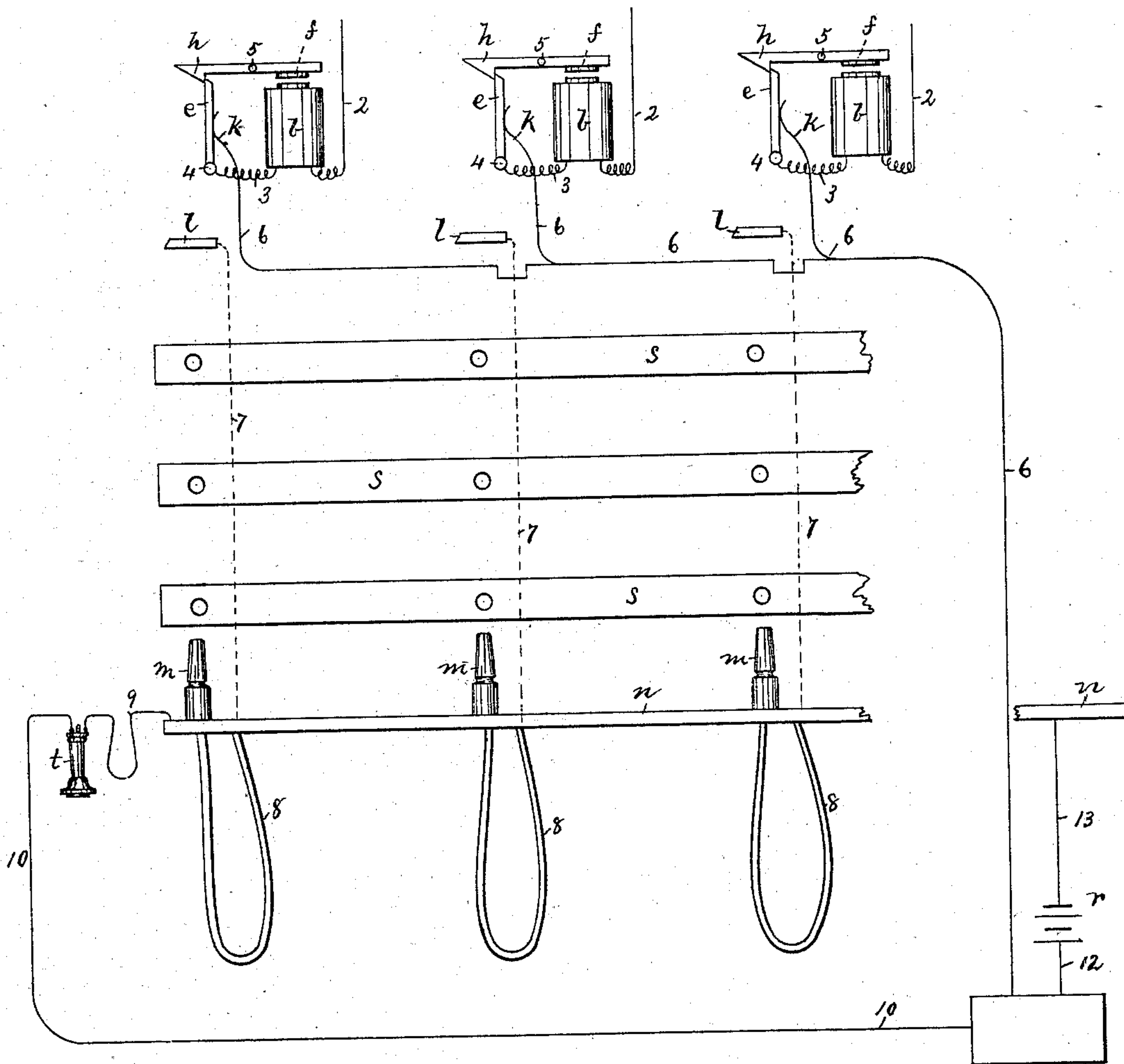
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Fig. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN A. MCCOY, OF FALL RIVER, ASSIGNOR TO CHAS. W. CLIFFORD,
(TRUSTEE,) OF NEW BEDFORD, MASSACHUSETTS.

TELEPHONE-CIRCUIT.

SPECIFICATION forming part of Letters Patent No. 278,351, dated May 29, 1883.

Application filed April 5, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. MCCOY, of Fall River, county of Bristol, State of Massachusetts, have invented an Improvement in Telephone-Circuits, of which the following description, in connection with the accompanying drawings, is a specification.

My invention relates to telephone-circuits, and has for its object the simplification of operations at the central office which have to be performed in order to connect one subscriber with another. In some of the systems now in use the different telephonic circuits are provided at their terminals in the central office with annunciators which are operated by an electric current applied by a subscriber who wishes to communicate, the said operation of the annunciator (which may be a hinged flap or cover that falls to disclose a number) signaling both that some one wishes to be heard and from what circuit the said signal comes. The next operation is to connect by a suitable switch apparatus the circuit thus announced with a telephone at the central office, in order to hear what connection is desired; and my invention consists in making this switching operation automatic. In other words, my invention consists in providing an automatic switch to connect the central-office telephone with that of the person signaling, the said switch to be operated at the same time that the central office is signaled. As herein shown, the annunciator itself is of metal, and is a portion of the telephonic circuit which passes through an electro-magnet to operate the said annunciator, and when the latter is in its normal condition, the circuit not being in use, the said circuit passes on through a battery, if necessary, to the ground. When a subscriber on the circuit interposes a local battery by a suitable key the electro-magnet is vitalized and releases the annunciator, which, in falling, breaks the connection and cuts out the ground and battery, if used, and comes into connection with one electrode of the central-office telephone, the other electrode being grounded, and thus places the said telephone in circuit with the instrument of the subscriber signaling. The annunciator-flap is shown as arranged to fall against a metal stop connected by a flexible wire with a switch-plug, and the switch-

plugs of all the circuits which are to be used in connection with one central-office telephone normally rest in contact with a plate in connection with the said office-telephone, so that any annunciator, in falling, makes the desired connection, and after the proper instructions are received the plug may be removed from the said plate, thus cutting out the central telephone, and placed in a metal strap, in which the plug belonging to the circuit with which connection is desired may be also placed after dropping its annunciator, to place it in circuit, and properly signaling the desired subscriber in any usual manner.

Figure 1 is a front view of the apparatus at the central office connected with the end of a telephonic circuit and embodying my invention. Fig. 2 is a rear view thereof. Fig. 3 is a section on line *x x*, Fig. 1. Fig. 4 is a sectional detail on line *y y*, Fig. 1; and Fig. 5, a diagram showing a series of subscribers' circuits arranged in accordance with my invention.

The circuit in question is connected with the binding-screw *a*, whence it passes by wire 2 to and then through the coils of the electro-magnet *b*, and by wire 3 to the metal frame *c* of the said magnet, electrically connected by screws *d* (see Fig. 4) with the annunciator-flap frame, and flap *e*, hinged at 4. The electro-magnet *b* is provided with an armature, *f*, carried on one end of a lever pivoted at 5, and provided at its other end with a hook, *h*, normally held by a spring, *i*, in position to engage and hold up the flap *e* when the said magnet *b* is demagnetized, the flap *e* then being in contact with a spring, *k*, connected by wire 6 with the ground, thus completing the circuit described. When the electro-magnet *b* is magnetized by a current on the circuit just described, it attracts the armature *f*, disengaging the hook *h*, which releases the flap *e* and allows it to fall, as shown in dotted lines, Fig. 3, thus breaking the connection with the spring *k* and all in circuit beyond it. The flap *e* in thus falling comes and then rests in contact with the metal stud *l*, connected by wire 7 with the flexible wire 8, provided with the usual insulating-cover, and terminating in a metal plug, *m*. All the metal plugs *m*, which form the terminals of the different circuits,

(see Fig. 5,) rest in contact with a plate, *n*, connected by wire 9 with one electrode of the central-office telephone *t*, the other electrode whereof is connected by wire 10 with the ground. It will be readily understood that when a subscriber signals, the flap *e* falls, thus making the current from *a* through wire 2, frame *c*, flap *e*, stud *l*, wires 7 and 8, plug *m*, plate *n*, to and through the telephone *t*, thus immediately placing an operator in charge of the telephone *t* in communication with the subscriber. If desired to connect this circuit with another, the plug *m* is placed in one of the straps *s*, and the plug *m* of the other circuit, after being connected by dropping the flap *e* of the said circuit and signaling the desired subscriber, is placed in another hole in the same strap, thus connecting the two subscribers.

The battery *r* for calling a subscriber is connected by wire 12 with the ground and by wire 13 with the plate *u*, and when the old tap-bell system of signaling is used, the plug *m* of the proper circuit may be tapped the proper number of times on the said plate to call a subscriber.

When the apparatus is to be used with the signal apparatus invented by me, for which I have filed an application for Letters Patent, the plug *m* would be connected with the key therein shown as connected with the main-line circuit, and designated by the reference-letter *b*, after which the keys would be properly manipulated to sound the desired signal.

The electro-magnet *b* may be operated in any manner desired, as by a magneto-electric or battery current in the circuit *a 2 b c d e k* 6; or it may be operated by a local battery controlled by a relay in the circuit just described, (with the exception of the coils *b*;) and it will be observed that all apparatus which is not desired in the circuit when used for telephone communication should be placed in the said circuit beyond the spring *k*.

It is obvious that various modifications may be made in the form of apparatus without departing from the principle of the invention,

and that it may be readily adapted for use with any of the usual switch-boards and instruments at the subscriber's station. The flap *e*, for instance, might fall directly upon the plate *n* to connect in the office-telephone.

I claim—

1. In a telephone central-office system, the subscriber's circuit and the annunciator-signal forming a part of the said circuit, and an electro-magnet to operate it, combined with the branch circuit containing telephonic instruments, and normally disconnected from the said subscriber's circuit, the said branch circuit being adapted to be connected with the subscriber's circuit by the signal in its movement caused by the electro-magnet, substantially as described.

2. The series of subscribers' circuits, and continuations of the said circuits normally separated therefrom and all uniting in a single circuit, combined with the series of automatic switches and electro-magnets to operate them, one in each of the said subscribers' circuits, each switch being adapted to connect its circuit with the continuation thereof, whereby instruments in the circuit formed of the union of the said branches are made common to all of the said subscribers' circuits, substantially as described.

3. In a telephonic apparatus, a series of subscribers' circuits and continuations thereof, combined with the annunciator-signals, the metal of which forms a portion of the said circuits, and is disconnected from the said continuations when the annunciator-signal is in its normal condition awaiting a signal, but completes the connection with the said continuation when the said signal is produced, substantially as described.

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

JOHN A. McCOY.

Witnesses:

JOS. P. LIVERMORE,
L. F. CONNOR.