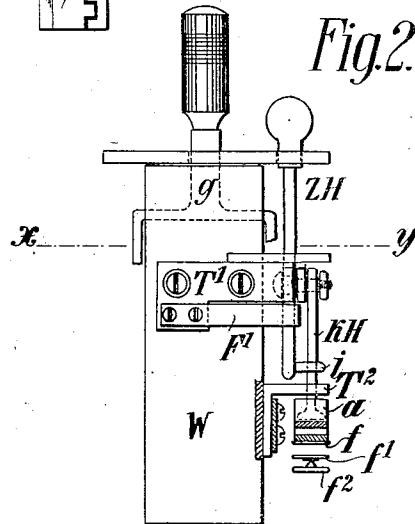
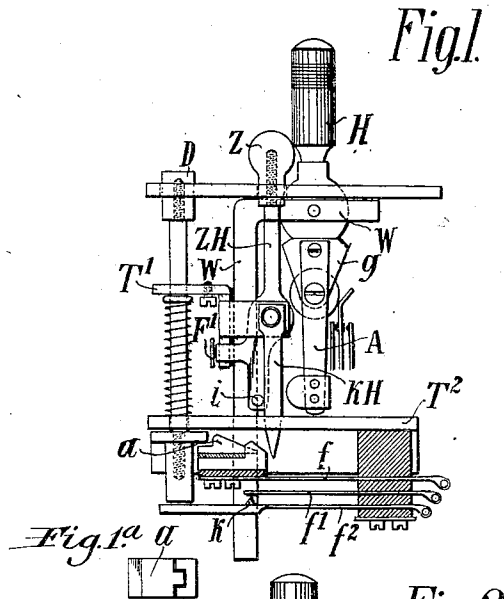


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 MEANS FOR COUNTING CONVERSATIONS AT TELEPHONE EXCHANGES.
 APPLICATION FILED JULY 12, 1907.

921,429.

Patented May 11, 1909.

2 SHEETS—SHEET 1.



WITNESSES

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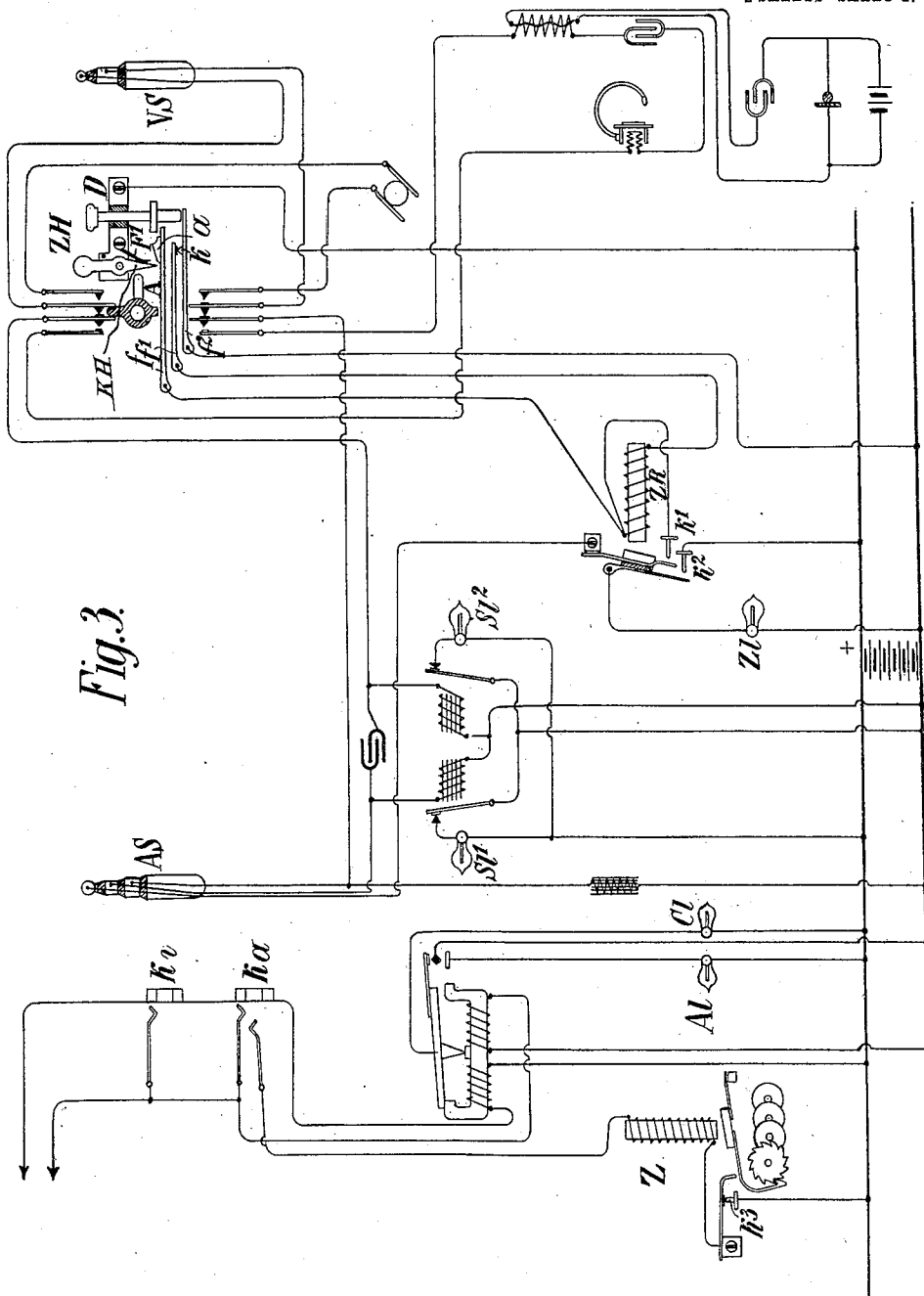
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JOHANN HEINRICH MEYER, OF MAGDEBURG, GERMANY.

MEANS FOR COUNTING CONVERSATIONS AT TELEPHONE-EXCHANGES.

No. 921,429.

Specification of Letters Patent.

Patented May 11, 1909.

Application filed July 12, 1907. Serial No. 383,479.

To all whom it may concern:

Be it known that I, JOHANN HEINRICH MEYER, a subject of the Emperor of Germany, residing at and whose post-office address is Sternstrasse 8, Magdeburg, in the German Empire, have invented Means for Counting Conversations at Telephone-Exchanges, of which the following is a specification.

The present invention has for its object a conversation counter in telephone exchanges for local business. It consists of a counter circuit-closer connected with the speaking and call change-over switch, a relay and incandescent lamp, and of the counting mechanism proper with a circuit breaker.

In order that the invention may be clearly understood reference is made to the accompanying drawing in which one embodiment is shown by way of example, and in which:

Figure 1 is a side elevation of the counter circuit-closer arranged on the speaking change-over switch, Fig. 1^a is a plan view of the part *a* detached. Fig. 2 is a front elevation of the same, and Fig. 2^a is a section on the line *x-y*, Fig. 2. Fig. 3 is a diagram of the connections of the devices at the exchange.

The change-over switch is operated by moving the lever *H* over to the left (Fig. 1) for speaking, and to the right for calling; the central position is the normal position and for through transmission. For obtaining the current for counting the lower fork-shaped arm *g* of the lever *H* is lengthened by an additional piece or arm *A*; further, there are two holders *T*¹ and *T*² rigidly screwed to and insulated from the angle-piece *W*, of which *T*¹ carries the contact-lever *K H* and the counter-lever *Z H*, and *T*² carries three contact-springs, namely, *f* with the top piece *a*, *f*¹ and *f*², whereas both holders serve for guiding the shaft of the press-button *D*.

When the lever *H* is placed in the call position the arm *A* drives the contact-lever *K H* and, by means of the pin *i*, the counter-lever *Z H* also, and pushes the pointed end of the contact-lever *K H* on to the top-piece *a*, thus making a conducting connection between *K H* and *f*. In this position the levers remain, unaffected by the further movements of the switch-lever *H*, until they are returned into their normal position for the purpose of counting by a short pressure on the button *Z* of the counter-lever *Z H*, so that the contact *K H*^a, simultaneously is opened again.

The press-button *D* is provided so that the preparation for counting, which is effected automatically, can be done away with at any time without a count taking place, the contact *k* between the springs *f*¹ and *f*² being opened first when the button is pressed, whereby the counter-battery is cut out; then the spring *f* is depressed causing the contact *K H*^a to open and the two levers to return into their normal positions under the action of the spring *F*¹. The relay is of the usual kind and its mode of action may be seen from the diagram of connections shown in Fig. 3. The relay closes a circuit for the current from the central battery to the counting-mechanism by means of a flow of current effected automatically by the circuit-closer, until, by switching the counter-lever *Z H*, the short-circuit which is made through this to the counter-mechanism is removed, and the counter-mechanism, which thereby receives current, is switched on one unit which the appertaining incandescent lamp indicates.

The counter-mechanism differs from counters of the usual kind only by its being provided with a circuit-breaker which cuts out the relay and extinguishes the counter-lamp.

A counter-mechanism is arranged on each subscriber's line, whereas only each pair of cords which are used for connecting the lines together is provided with a counter circuit-closer and relay.

In the diagram of connections the counter is shown in connection with a multiple switchboard for central-battery operation.

The counting of the conversation is effected after the call of the desired subscriber is ended, and after the subscriber has come to the apparatus and has taken up the receiver from the automatic hook for conducting the conversation. The counting is effected as follows: When the call-lamp *A*¹ lights up, the operator connects himself with the apparatus by inserting the answering-plug *A S* into the spring-jack *K*^a and turning the change-over switch *H* to the left (Fig. 1). After the operator has ascertained the number of the desired subscriber and has found that the line is clear and has switched the same into circuit, he places the lever into the call position to the right; the contact *K H*^a is then closed by the arm *A* (Fig. 1); the counter-lever *Z H* is placed on the top-piece *a* and does not then participate any more in the further movements of the lever. In consequence of the closing of the contact *K H*^a,

the central battery, which is used in common for counting, is short-circuited across the relay Z R (Fig. 3); the contacts k^1 and k^2 close and the counter-lamp ZL lights up.

5 Accordingly, if the called subscriber has gone to his apparatus and has removed the receiver from the automatic hook, the control-lamp SL^2 becomes extinguished, when the lever H again reaches its normal position, and
10 the count can take place. If this is not the case, the operator calls up again, and if the desired subscriber does not answer the second call also, the operator changes over into the answering position in order to acquaint the
15 calling subscriber about it.

Counting is effected by the operator returning the counter-lever Z H into its normal position, while he presses against the button of this lever Z H. The latter moves
20 under the action of the spring F^1 (Figs. 1 and 2) and thereby opens the contact K H^a. The current then flows from the negative pole of the battery over the contact k , relay Z R, contact k^1 , answering plug A S, spring jack
25 K^a, through the counting mechanism Z, contact k^3 and back to the positive pole of the battery. The contact k^3 is still closed and consequently still lights up the counter-lamp. The counter-mechanism attracts its
30 armature, and the latter moves the counter-disks on one unit, and at the end of its movement automatically interrupts the above described circuit, whereupon both the counter-mechanism and the relay become without
35 current and the armatures return into the normal position shown in the drawing. The counter-lamp goes out as a signal for the operator that the count has taken place.

An uncertain or too short time of contact
40 for the advance for the counting-mechanism cannot take place; likewise it is impossible for a count to be made again by mistake, as this can only be effected by returning the change-over switch-lever into the call position for which no occasion arises; in addition
45 to this a disturbance of the connection would be brought about. Lastly, counting cannot be omitted, because until it is effected the counter-lamp is continuously illuminated.

50 If for any reason the count is not intended to take place, for example, if the operator has connected by mistake with some one other than the desired subscriber, and therefore the succeeding correct connection need
55 not be accounted to the calling subscriber, the operator presses on the button D, the consequence of which is that the counter-battery is cut out of circuit and the levers return into their normal position without the
60 counter-mechanism being moved on.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a telephone-exchange system, the combination of a source of current, a switch-
65 lever connected with one pole of the latter,

a lamp-circuit and a counter-mechanism circuit, and a relay adapted to close said circuits, a contact connected with one end of the winding of said relay and adapted to be contacted by said switch-lever, a second contact connected with the other end of the winding of said relay, and a third contact connected with the other pole of said source of current and normally contacting the latter contact, as set forth.

2. In a telephone-exchange system, the combination of a source of current, a switch-lever connected with one pole of the latter, a lamp circuit and a counter mechanism circuit and a relay adapted to close said circuits, said counter mechanism having an electromagnet, with a coil adapted to be connected with one end to the armature of said relay, a contact of said relay adapted to be contacted by said armature and connected with one end of the winding of said relay, the other end of said coil adapted to be connected with said pole of said source of current, a contact connected with one end of the winding of said relay and adapted to be
80 contacted by said switch-lever, a second contact connected with the other end of the winding of said relay, and a third contact connected with the other pole of said source of current and normally contacting the latter contact, as set forth.

3. In a telephone-exchange system, the combination of a source of current, a switch-lever connected with one pole of the latter, a lamp circuit and a counter mechanism circuit and a relay adapted to close said circuits, said counter mechanism having an electromagnet, and a coil adapted to be connected with one end to the armature of said relay, a contact of said relay adapted to be contacted
105 by said armature and connected with one end of the winding of said relay, a circuit breaker adapted to be actuated by said electromagnet connected with the latter and with said pole of said source of current, a contact connected with one end of the winding of said relay and adapted to be contacted by said switch-lever, a second contact connected with the other end of the winding of said relay, and a third contact connected
115 with the other pole of said source of current and normally contacting the latter contact, as set forth.

4. In a telephone-exchange system, in combination, a source of current, a switch-lever connected with one pole of the latter, a lamp circuit and a counter mechanism circuit and a relay adapted to close said circuits, said counter mechanism having an electromagnet, and a coil adapted to be connected
125 with one end to the armature of said relay, a contact of said relay adapted to be contacted by said armature and connected with one end of the winding of said relay, the other end of said coil adapted to be connected with
130

said pole of said source of current, another contact on said relay connected with said pole of said source of current, a second armature on said relay adapted to contact the latter contact, a lamp connected with the latter armature and connected with the other pole of said source of current, a contact, connected with one end of the winding of said relay and adapted to be contacted by said switch-lever, another contact connected with the other end of the winding of said relay, and another contact connected with the other pole of said source of current and normally contacting the latter contact, as set forth, for the purpose specified.

5. In a telephone-exchange system, the combination of a source of current, a switch-lever connected with one pole of the latter, a lamp circuit and a counter-mechanism

circuit, and a relay adapted to close said circuits, a contact connected with one end of the winding of said relay and adapted to be contacted by said switch-lever, a second contact connected with the other end of the winding of said relay, a third contact connected with the other pole of said source of current and normally contacting the latter contact, and means for preventing said third contact from contacting said second contact, as set forth.

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

JOHANN HEINRICH MEYER.

Witnesses:

JOHANNES STEIN,
HENRY HASPER.