

(No Model.)

C. W. ROSS & G. H. TWISS.  
TELEPHONE EXCHANGE SWITCH BOARD.

No. 258,868.

Fig 1.

Patented May 30, 1882.

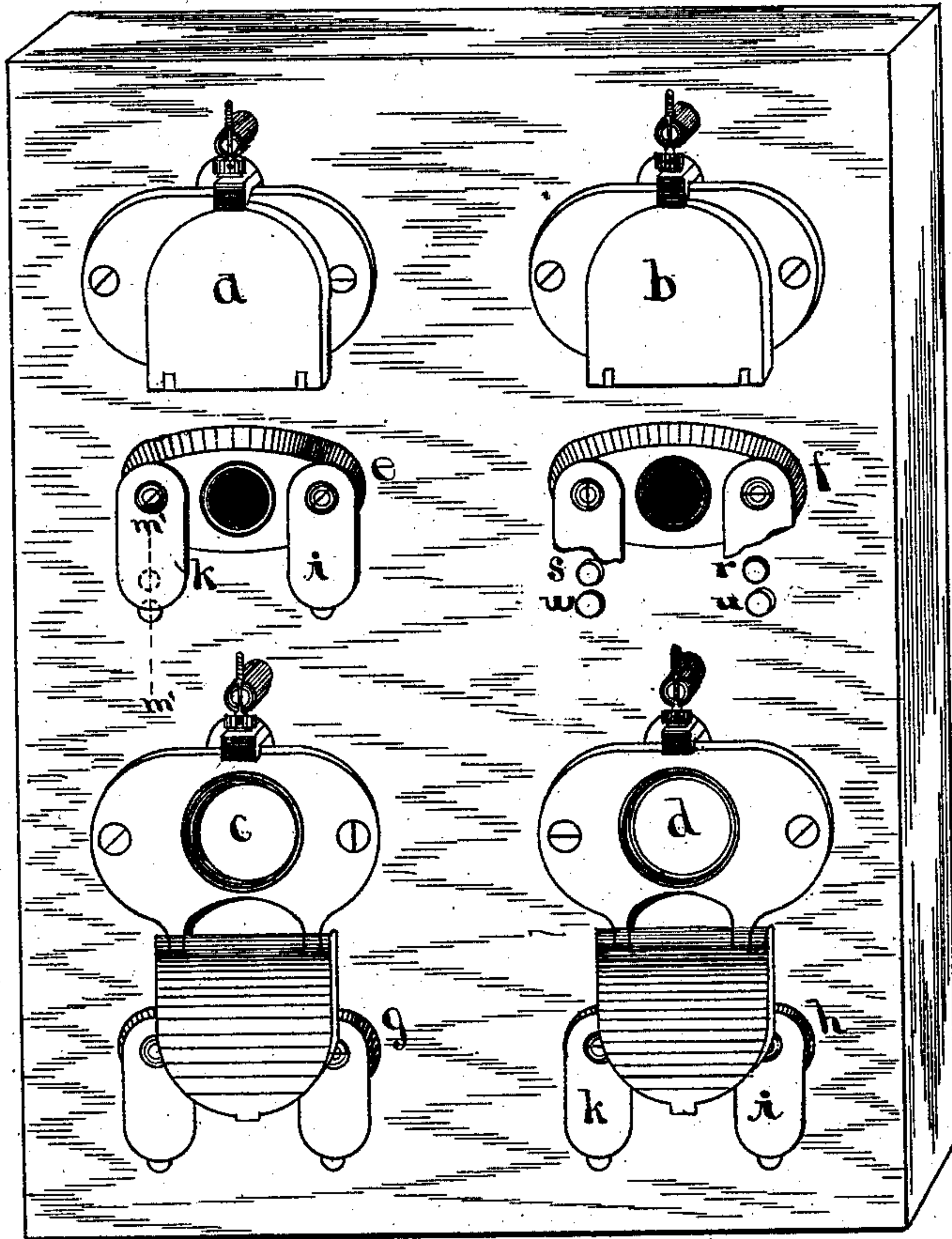


Fig 2.

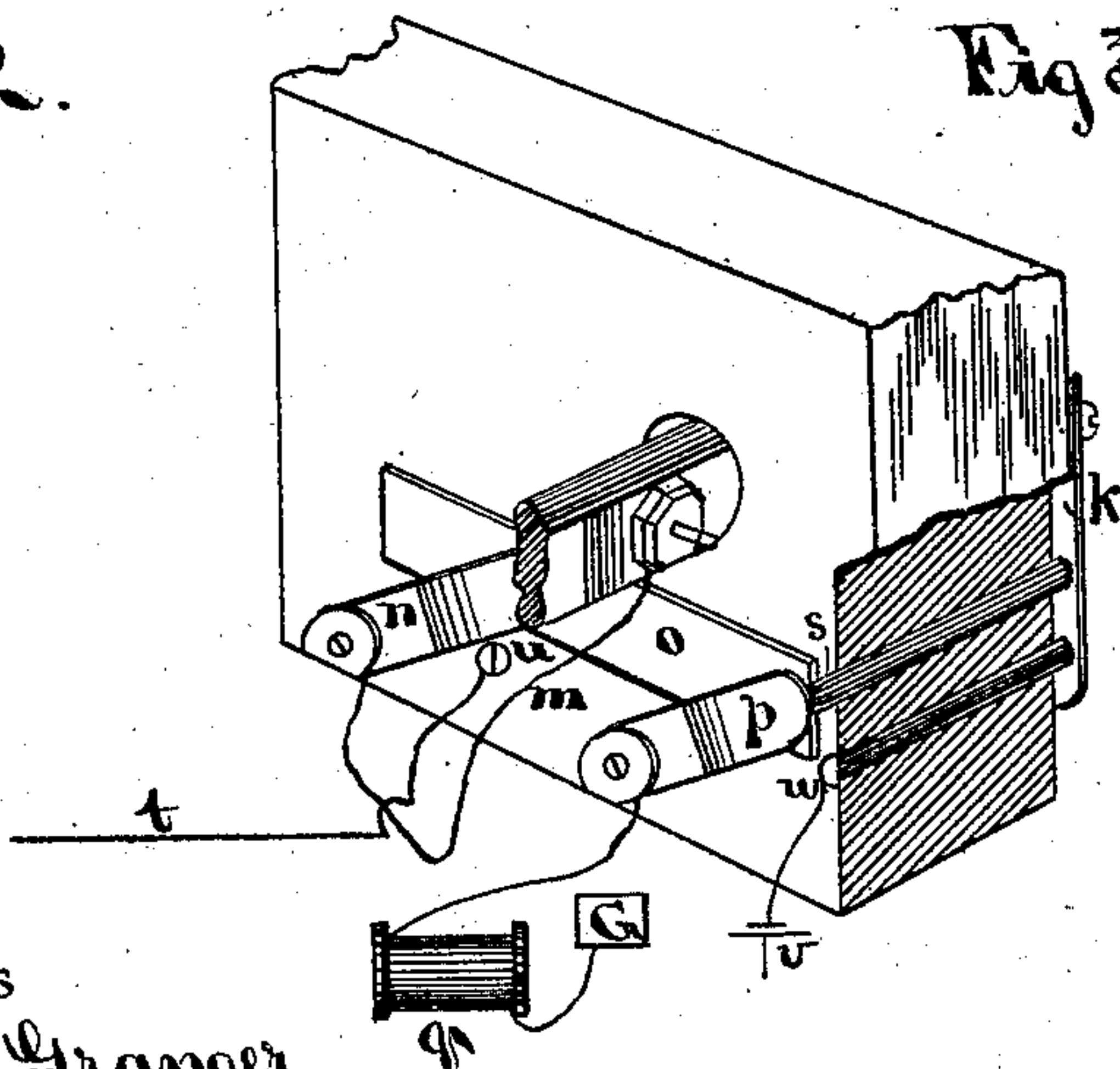
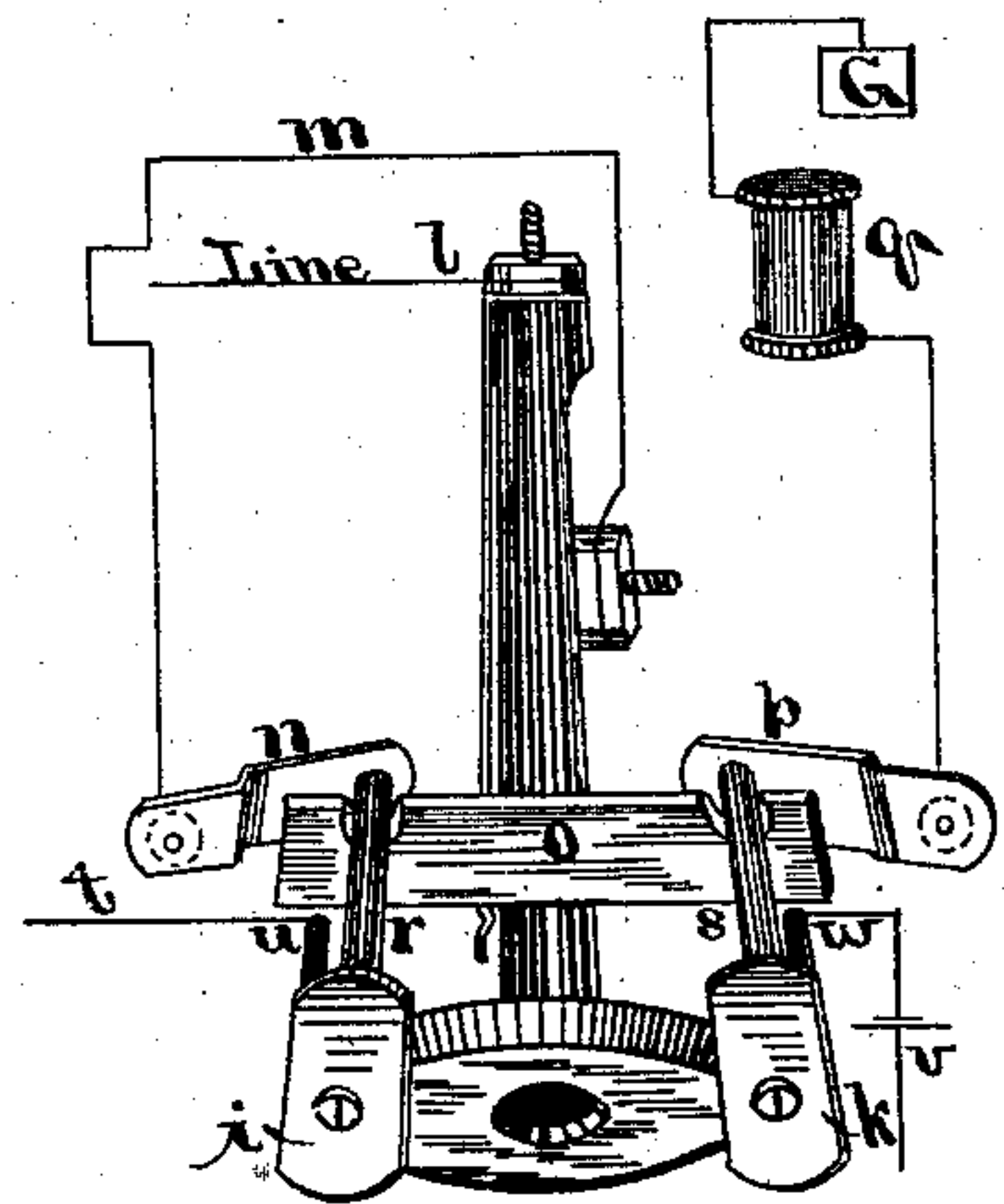


Fig 3.



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# UNITED STATES PATENT OFFICE.

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## TELEPHONE-EXCHANGE SWITCH-BOARD.

SPECIFICATION forming part of Letters Patent No. 258,868, dated May 30, 1882.

Application filed March 20, 1882. (No model.)

To all whom it may concern :

Be it known that we, CHARLES W. ROSS and GEORGE H. TWISS, of Columbus, Ohio, have jointly invented certain new and useful Improvements in Telephone-Exchange Switch-Boards, of which the following is a full, clear, concise, and exact description.

Our improvements relate to the arrangement of the switches and annunciators upon the switch-board and to the circuits of the telephone-lines.

Our improvements consist in placing the annunciator of each line directly over its switch, so that the shutter, when down, may obstruct the plug-hole of the switch, and in the connections for the signal-battery and operator's telephone with the telegraph-lines.

In the drawings, Figure 1 is a front elevation of a portion of a switch-board. Fig. 2 is an angular perspective of a part thereof, a portion being in section of line  $m'm'$  of Fig. 1. The rear end of the spring-jack is broken away. Fig. 3 is a parallel perspective, showing the connections of the operator's outfit and the generator with the telephone-line in detail.

Like parts are indicated by similar letters of reference in the different figures.

The annunciators  $a b c d$  and the switches or spring-jacks  $e f g h$  are constructed in the usual manner. When a subscriber sends a current to line the drop of his annunciator is thrown down, (see annunciators  $c d$ ), and when a connection is made with the line by means of the ordinary flexible cord provided with a terminal plug, the plug, when inserted, moves the lever of the switch, so as to take off the ground of the subscriber's line in the usual manner.

$i$  and  $k$  are springs electrically connected with the frame of the switch. The subscriber's line is connected with the frame of the switch, as shown at  $l$ , and his circuit normally passes, as shown, by line  $m$  to spring  $n$ , thence to connecting-bar  $o$  and to spring  $p$ , and thence, through the electro-magnet  $q$ , to ground.

$r$  and  $s$  are pins of wood or other non-conducting substance, which are placed between springs  $i n$  and springs  $k p$ , respectively, as shown.

$t$  is the line of the operator's outfit, and terminates in a contact point or pin,  $u$ , near spring  $i$ .

$v$  is the line of the generator or signaling battery, and terminates in a contact point or pin,  $w$ , near spring  $k$ .

When a shutter falls the operator answers the call by pressing on spring  $k$  of the switch in the line of the annunciator. She thus takes off the ground by separating spring  $p$  and bar  $o$ , and at the same time closes the calling-battery to line, contact being made between spring  $k$  and pin or point  $w$ . By then pressing on spring  $i$  the operator's telephone-outfit is connected to line at point  $u$ , the ground being taken off by the non-conducting pin  $r$  lifting spring  $n$  from connecting bar or strip  $o$ . The operator thus receives the order of the subscriber. The subscriber wanted is summoned by pressing upon the spring  $k$  of his switch. His answer to the call throws down the shutter of his annunciator. The operator then, by pressing upon his spring  $i$ , connects her outfit with the called subscriber, provided she wishes to inform him who has called. The two subscribers' lines are then connected in one circuit through the central office in the usual manner by means of plugs and flexible cords.

It is usual to place a clearing-out annunciator in the circuit of the cords connecting any two switches.

The operator may connect any two subscribers— $S'$  and  $S^2$ , for example, the two connected with switches  $e$  and  $h$ —as follows: On seeing the shutter of annunciator  $d$  fall she immediately presses on spring  $i$ , and is told by subscriber  $S'$  that he wishes to talk with subscriber  $S^2$ . She at once connects the two switches by means of a flexible cord with terminal plugs, and taps on spring  $i$  of the switch of  $S^2$ , and then is ready for the next call. If  $S^2$  should be busy, she would simply notify  $S'$  of the fact.

By the system heretofore used the operator must insert a plug in the spring-jack of the calling subscriber before she can connect her outfit with his line, and in case the subscriber wanted should be engaged the plug must be removed. Thus when the connection asked for cannot be had two motions are dispensed with



by the use of my system, and in other cases the shutter is restored, as it were, by the same motion with which the plug is inserted in a subscriber's switch.

5 I claim—

1. The subscriber's ground-circuit in combination with two contact-springs, one for connecting with the operator's outfit, the other for taking off the ground, and an intermediate non-  
10 conducting pin whereby, when the former is depressed so as to connect with the operator's outfit, the latter will be moved automatically, so as to take off the ground.

2. The combination of the circuit of a telephone-line through the spring jack and annunciator to ground with two springs, one for connecting with the operator's outfit, the other for connecting with the generator, and means  
15 whereby the ground is automatically taken off when either spring is depressed, as and for the purpose specified.

3. The combination, upon the switch-board of a telephone-exchange, of spring-jacks, one for each line, each line passing through its spring-jack to ground, and pairs of keys, one  
25 pair for each spring-jack, one key of each pair for connecting to the operator's outfit, the other for connecting with the generator.

4. The combination, upon the switch-board of a telephone-exchange, of spring-jacks, one  
30 for each line, each line passing through its spring-jack to ground, and pairs of keys, one pair for each spring jack, one key of each pair for connecting to the operator's outfit, the other for connecting with the generator, and means  
35 at each pair whereby the ground is automatically removed when either key is depressed.

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