

No. 689,631.

Patented Dec. 24, 1901.

S. J. BALLARD.  
TELEPHONE INDICATOR.

(Application filed Apr. 11, 1900.)

(No Model.)

Fig. I

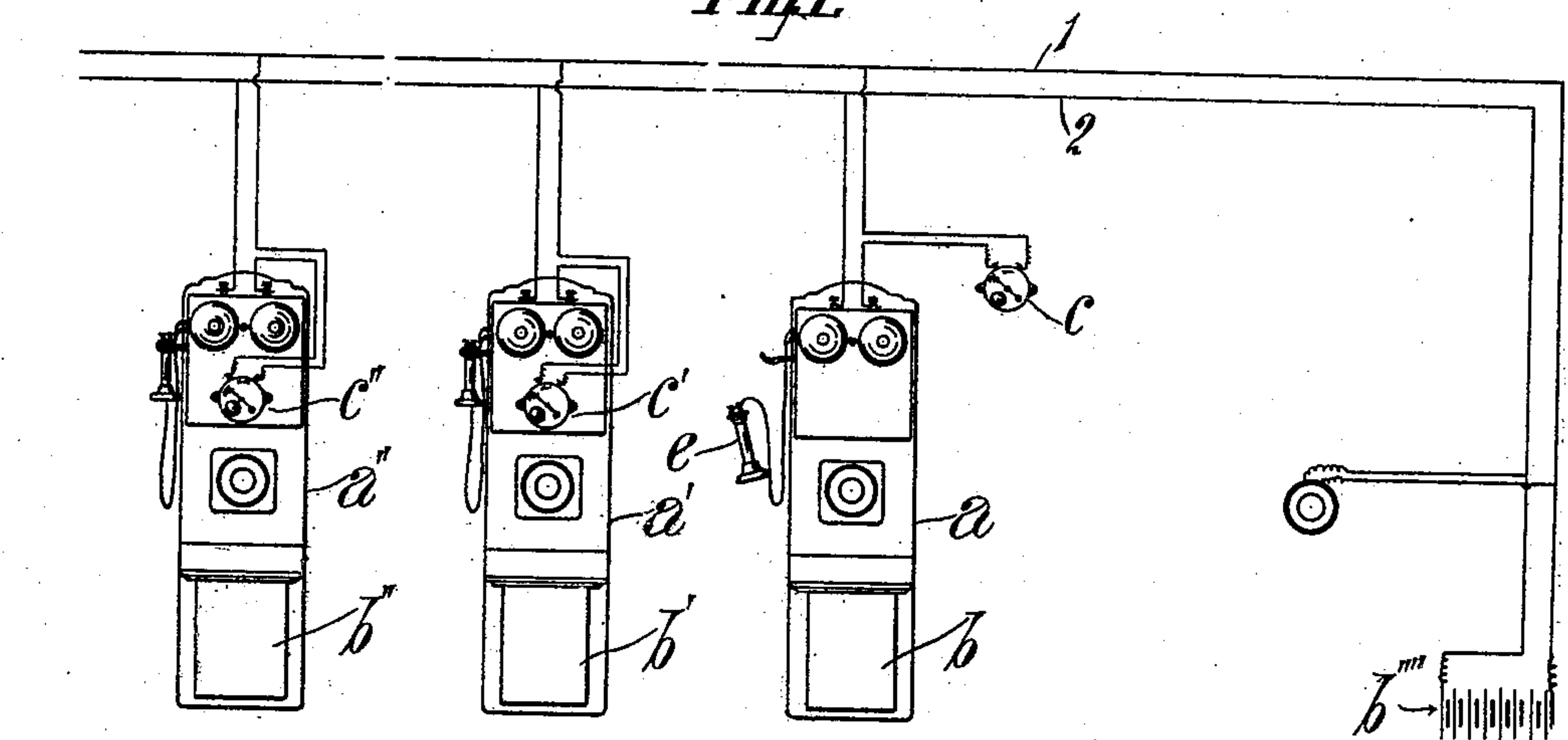
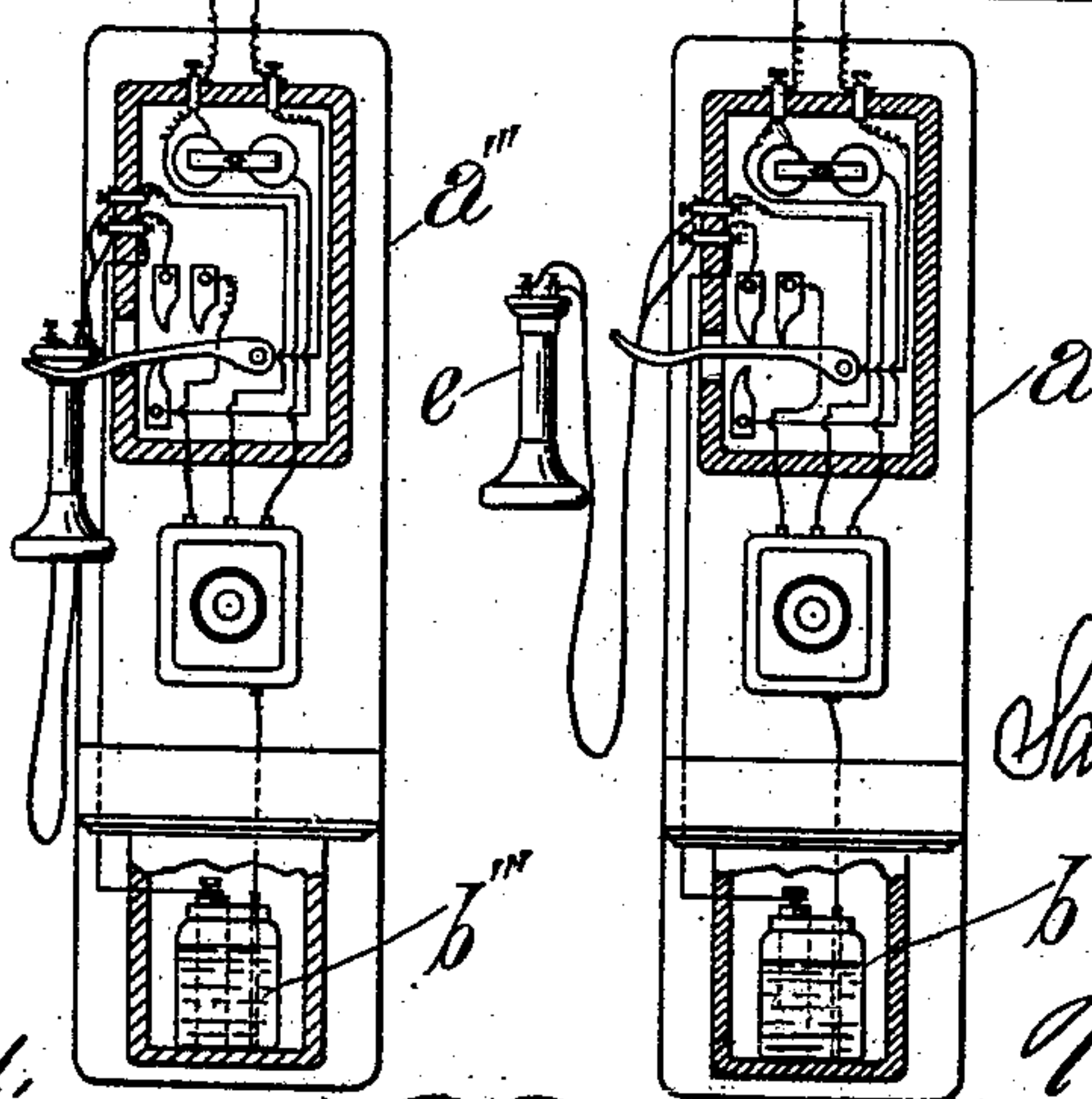
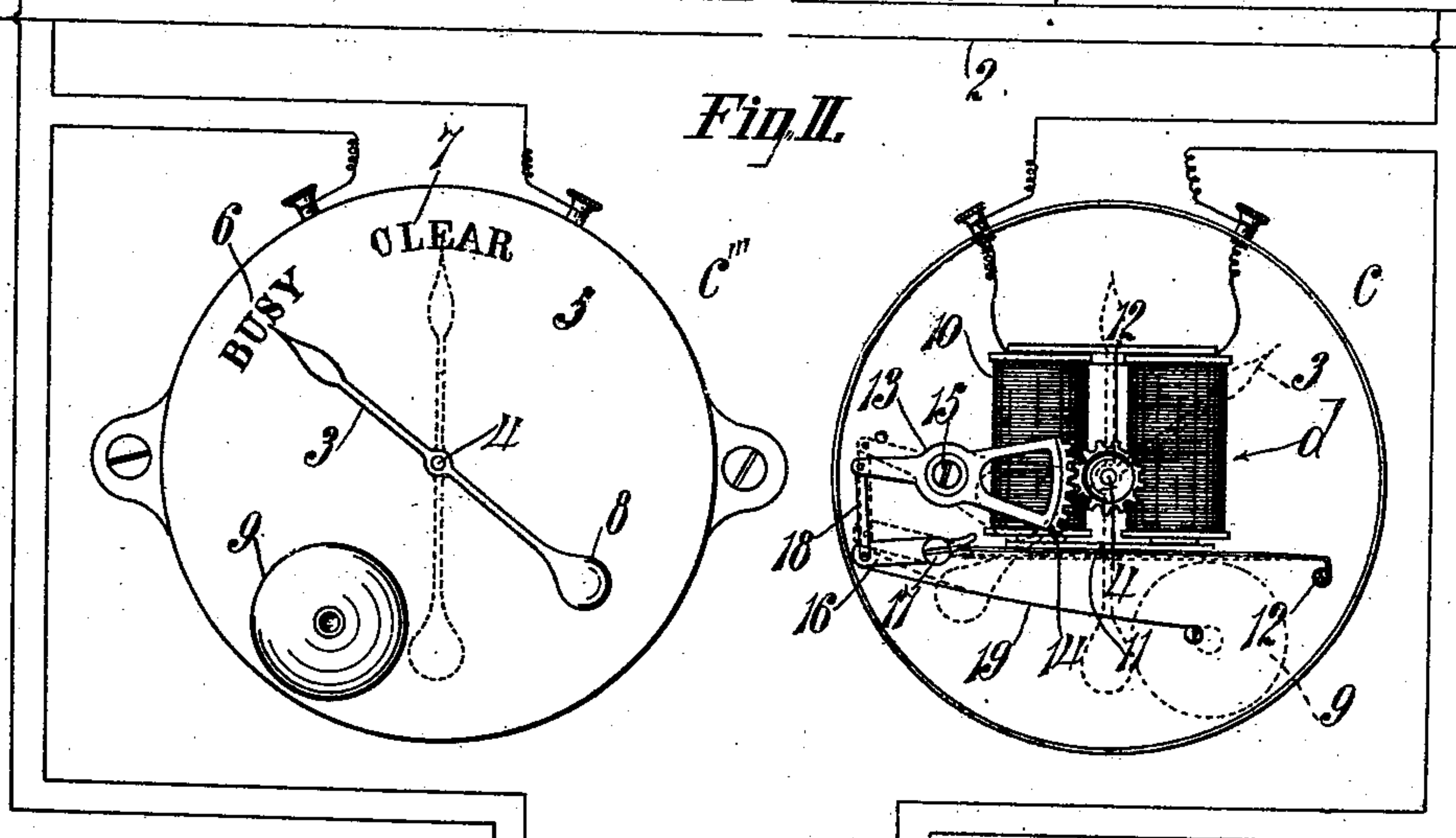


Fig. II



Witnesses  
Deputy Registrar.  
J. Townsend.

Samuel Judson Ballard  
by  
Townsend Bros.  
his atty.



# UNITED STATES PATENT OFFICE.

SAMUEL JUDSON BALLARD, OF LOS ANGELES, CALIFORNIA.

## TELEPHONE-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 689,631, dated December 24, 1901.

Application filed April 11, 1900. Serial No. 12,481. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL JUDSON BALLARD, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Telephone-Indicators, of which the following is a specification.

The object of my invention is to provide means for automatically announcing whether the party or extension line is busy or clear. I accomplish this desirable object by the combination, with an extension or party line telephone system, of a pointer pivoted to vibrate and arranged to normally stand in a given position, an electromagnet connected with the line-wire of the system to be energized by the current passing through said wire, and means connecting the magnet-armature with the pointer to temporarily deflect the pointer from its normal position, thus to indicate by its deflection that the line is busy whenever a current is passing through the line from any of the batteries in the system and to indicate by its return to normal position that the line is clear when the battery is off the line. In my improvement all of the telephones of the party-line are provided with indicators, respectively, and all of the indicators operate synchronously whenever any one of the receivers in the entire circuit is taken from its hook. My invention includes such combination and also the specific mechanism by which the above-mentioned object is attained.

The invention is applicable to any metallic circuit and any grounded circuit with which a number of service-machines, such as telephones, is connected.

The accompanying drawings illustrate my invention.

Figure I is a fragmental view of a telephone extension or party line system provided with my invention. In this view three of the telephones of the system are shown, and in each of two of the telephones the indicator is mounted on the telephone-case, while in the other telephone it is shown set off to one side on the wall, thus to indicate that it is immaterial at what point the indicator is placed. Fig. II is a detail view, on an enlarged scale, showing two telephones of

the system and two indicators, one for each telephone. One of the indicators is shown in front view and the other indicator is shown in back view with the indicator mechanism exposed, the rear plate of the case being omitted from the view for this purpose.

The line-wires of the party-line system are indicated by 1 2. The telephone instruments are indicated by  $a a' a'' a'''$ . The batteries are indicated in a general way by  $b b' b'' b''' b''''$ . The indicators are indicated in a general way by  $c, c', c'',$  and  $c'''$ .

3 indicates the pointer of the indicator. It is pivoted by means of the shaft 4 to vibrate in front of a dial 5, upon which are marks 6 7 to indicate the line clear and the line busy. The apparatus is to be arranged so that the pointer will normally point, as shown in dotted lines in Fig. II, to the marks which indicate that the line is clear. For this purpose the pointer is provided with a heavier portion or ball 8 at its lower end, which ball constitutes a striker for striking a gong 9, which is located in the path of vibration of the striking portion of the pointer, so that when the pointer is released from the position in which it points to the busy side it will swing far enough to strike the gong 9, thus to sound an alarm whenever the line is released from service.

$d$  in a general way indicates an electromagnet, the coils 10 of which are connected with the line-wire of the system to be energized by the current passing through such wire. Suitable means are provided connecting the magnet-armature 11 with the pointer 3 for throwing the pointer in one direction—viz., with its point toward the busy side and its striker away from the gong. This mechanism is to be of such a character as to allow or cause the pointer to return to its normal position when the magnet is demagnetized by the battery being taken off the line. Preferably such mechanism comprises a pinion 12, fixed to the shaft 4 of the pointer, a lever 13, provided with a cogged segment 14 and pivoted by a pivot 15, with the cogged arc meshing with the pointer, a lever 16, pivoted by a pivot 17 and in operative engagement with the armature to be thrown thereby when the magnet is energized, and a connecting-rod 18, connecting the end of the lever 17 with the end



of the lever 13 which is opposite the cogged segment. The short arm of the lever 16 preferably rests upon the armature 11, which is hinged at 12, and the coils of the magnet are arranged to draw the armature up against the force of gravity and at the same time to move the cogged segment up, thus to rotate the pinion 4 to multiply the motion which is transmitted from the armature to the pointer.

The cogged segment is preferably of such a weight that it, together with the uncounter-balanced gravity of the other parts, will bring the pointer to normally point at the marks which show that the line is clear. The excess of weight, however, must not be such as to prevent the pointer from being thrown to the marks which show that the line is busy whenever the electromagnet is energized by a current from any battery in the system.

In each of the drawings the receiver of one of the telephones is shown off the hook, thus to show the line in its busy condition, and the pointer is shown in position to indicate such condition of the line. When the telephone-receiver is replaced on the hook, the current will be taken off of the wire and the index will swing back and pass the normal position, so that the striker 8 will strike upon the gong 9, thus to give an audible warning to any person who may be desiring to use the telephone in the system. Then the gravity of the parts will hold the pointer in normal position until the receiver of the system is again taken off the hook. It is immaterial which receiver is taken from its hook, for the current from any of the batteries will energize all the indicator-magnets of the system.

19 indicates a spring arranged to assist gravity to return the parts to normal position quickly.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination with an extension or party line telephone system; of a pointer pivoted to vibrate; means for normally holding the pointer in a given position; an electromagnet connected with the line-wire of the system to be energized by the current passing through said wire; and means connecting the magnet-armature with the pointer to temporarily deflect the pointer from its normal position.

2. The combination with an extension or party line telephone system; of a pointer provided with a striker and pivoted to vibrate

and arranged to normally stand in a given position between the ends of its path of vibration; an electromagnet connected with the line-wire of the system to be energized by the current passing through said wire; means connecting the magnet-armature with the pointer for throwing the pointer in one direction; and a gong arranged in the path of the striker to be struck by the striker upon its return after the pointer is released by the de-energizing of the magnet.

3. The combination with an extension or party line telephone system, of a plurality of pointers, one for each of the telephones of the circuit respectively pivoted to vibrate; means for normally holding the pointers respectively in a given position; electromagnets connected with the line-wire of the system to be energized by the current passing through said wire, and means respectively connecting the magnet-armatures with their respective pointers to synchronously temporarily deflect their respective pointers from the normal position.

4. The combination with a telephone line-wire, of a pointer; mechanism for rotating the pointer and arranged to hold the pointer in a normal position by the force of gravity; an electromagnet connected with the line to be energized by a current passing therethrough; the armature of the magnet being arranged to operate the mechanism against the force of gravity to throw the pointer from its normal position.

5. In a party-line system, the combination of a pointer pivoted to swing; a shaft connected with the pointer to deflect the same from its normal position; a pinion on such shaft; a pivoted lever provided with a cogged segment which meshes with the pinion; an electromagnet connected with the line-wire of the system to be energized by the current passing therethrough; a lever to be operated by the armature of the magnet; a connecting-rod connecting said lever with the cogged segment-lever; and means for returning the pointer to its normal position.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, at Los Angeles, California, this 27th day of March, 1900.

SAMUEL JUDSON BALLARD.

Witnesses:

JAMES R. TOWNSEND,  
JULIA TOWNSEND.