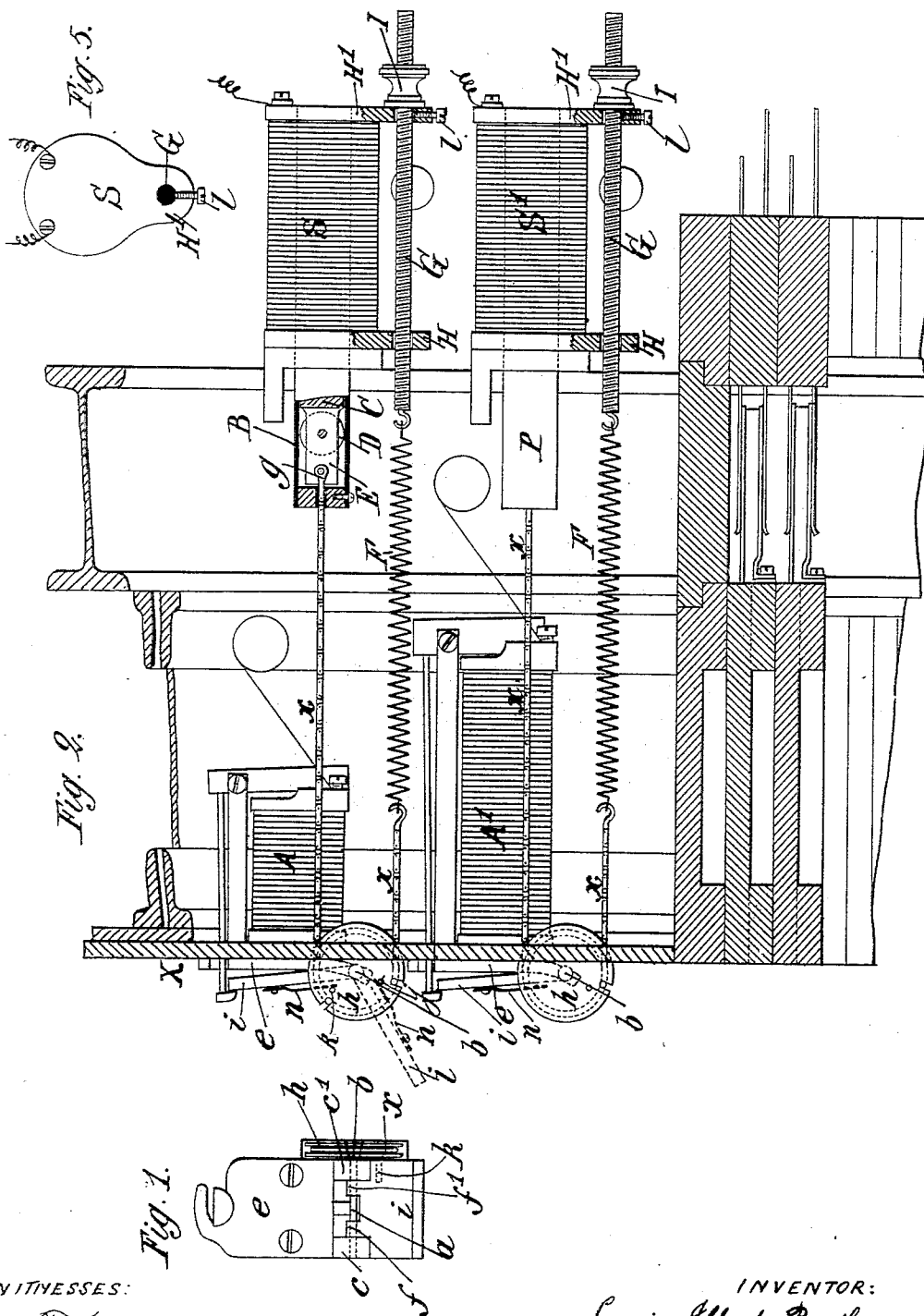


L. A. BERTHON.

RESTORING SYSTEM FOR ANNUNCIATORS.

No. 504,797.

Patented Sept. 12, 1893.



WITNESSES:

Fred White
C. K. Fraser.

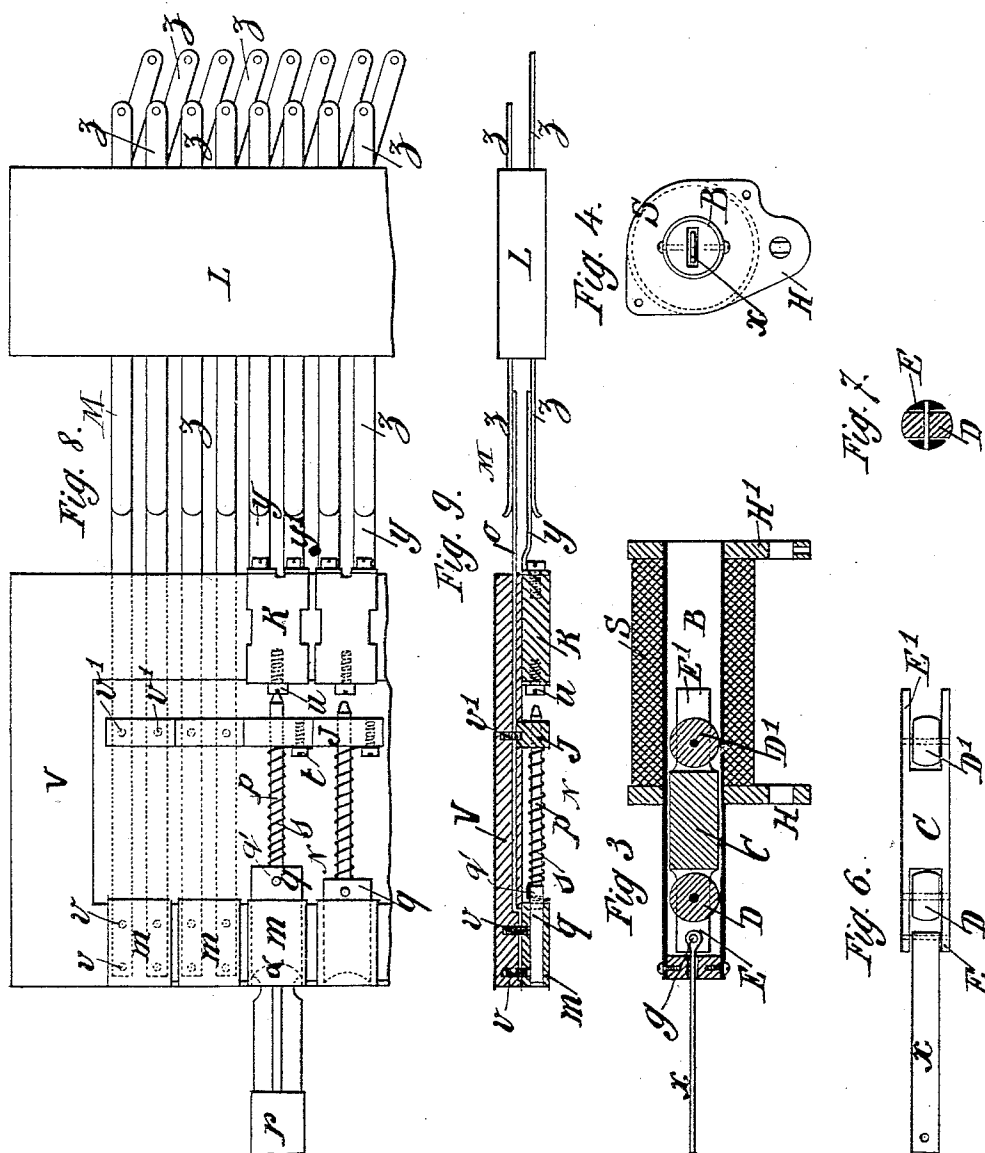
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Louis Alfred Berthon,
By his Attorneys.
Arthur C. Fraser & Co.,

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UNITED STATES PATENT OFFICE.

LOUIS ALFRED BERTHON, OF PARIS, FRANCE, ASSIGNOR TO THE SOCIÉTÉ GÉNÉRALE DES TÉLÉPHONES, (RÉSEAUX TÉLÉPHONIQUES ET CONSTRUCTIONS ÉLECTRIQUES.)

RESTORING SYSTEM FOR ANNUNCIATORS.

SPECIFICATION forming part of Letters Patent No. 504,797, dated September 12, 1893.

Application filed May 17, 1893. Serial No. 474,546. (No model.) Patented in France January 31, 1893, No. 227,557.

To all whom it may concern:

Be it known that I, LOUIS ALFRED BERTHON, a citizen of the Republic of France, residing in Paris, France, have invented certain new and useful Improvements in Systems of Electrically Raising Shutters of Telephone-Indicators, (which invention has been patented in France, dated January 31, 1893, No. 227,557,) of which the following is a specification.

This invention relates to telephonic exchanges and has for its object an improved system for electrically operating the indicator shutters in such exchanges without requiring the operator to act manually upon the shutter or indicator.

In carrying out the invention in its preferred form, I provide in connection with the usual call shutter or indicator, or the usual stop shutter or indicator, or with both, certain improvements in mechanical and electromagnetic means, as an electro-magnet or solenoid, operating when actuated by an electric current to restore the shutter to the closed position; and I provide an electric switch for controlling the current actuating such magnet or solenoid, one such switch being preferably provided for each subscriber's circuit, and each such switch being preferably located in proximity to or immediately under the usual spring-jack of the circuit of the subscriber to which its indicator corresponds, and constructed to be operated by the usual contact plug of such spring jack. By this provision the operator is enabled to speedily restore or raise the call shutter by operating its restoring switch with the end of the spring-jack plug just before inserting the latter into the spring-jack of the subscriber circuit, and again to restore the stop shutter in like manner immediately after withdrawing the spring-jack plug, thereby greatly facilitating and expediting the work of the operator.

In the accompanying drawings which illustrate the preferred adaptation of my invention, Figure 1 is a front elevation of an indicator shutter furnished with appliances for raising it electrically. Fig. 2 is a side view in section showing together the two indicators of a subscriber, that is to say, the call in-

dicator which is above, and the indicator for the end of the conversation, or stop indicator, which is below. Fig. 3 is a fragmentary axial section of a solenoid for restoring the shutter. Fig. 4 is a front elevation thereof. Fig. 5 is a rear elevation thereof. Fig. 6 is a plan view of the core thereof detached. Fig. 7 is a cross-section thereof. Fig. 8 is an under side plan view of the key-board or switches for the solenoids. Fig. 9 is a transverse section thereof.

Referring to the drawings, I will now describe the preferred adaptation of my invention.

Let A indicate the call indicator as a whole, A' the stop indicator as a whole, S the solenoid for restoring the former, and S' an identical solenoid for restoring the latter, M conductors constituting part of an electric circuit between any suitable battery and the solenoids, and N an electric switch controlling communication through said conductors, and thereby the operation of said solenoids.

I will now describe in detail the features of construction and operation of the adaptation of my invention shown in the drawings.

The axis of the shutter is a steel pin *a* having at its end a shoulder and conical head *b*. The body of the pin is held by strong friction in, or is forced into, the two parts *c c'* of the plate *e*, which latter is fixed on the front plate X, but it is free in the parts *f f'* of the shutter *i* thus forming a hinge therefor. A grooved pulley *h*, over which runs a small chain *x*, is mounted on the end part *b*, of the pin *a* free to turn thereon but held in position by the conical head thereof. This pulley has a stud *j* which forms a stop against the plate X when the shutter falls, and another stud *k* (Figs. 1 and 2) which serves to raise the shutter *i*. The stud *j* is not necessary, however, and may be omitted if desired. The action of the chain *x* which passes over the small pulley *h*, an action which causes the raising of the shutter, is produced electrically by means of solenoids which may be arranged horizontally or vertically. The horizontal arrangement is preferable as being more simple and less inconvenient, and yet all parts of the system can be easily dis-

mounted; as will be seen, the solenoids are independent of one another, so that any one can be replaced if required without troubling the others. Fig. 2 shows the arrangement with horizontal solenoids. Each call indicator A and each stop indicator A' has a corresponding solenoid S and S', shown separately in section by Fig. 3 and end view Fig. 4; each solenoid has a central copper tube B which serves as a guide to the soft iron core C. This core, shown separately in plan by Fig. 6, and in transverse section Fig. 7, is arranged as a carriage having two soft iron rollers D D' held in forks E E' cut in the soft iron of the core.

To the core C is attached by a plug *g* the chain *x*, the other end of which after passing round the pulley *h* is attached to an opposing spring F, which is attached to an adjusting screw G passing freely through holes in the plates of support H H' at each end of the solenoid, this screw being strained more or less by the nut I. The small screw *l* (see the end view Fig. 5) serves to guide or set the adjusting screw G.

The current is sent into the solenoid S of the indicator which has to be raised by means of suitable switches or keys within reach of the operator's hand. Figs. 8 and 9 show the arrangement in transverse section and in plan. It preferably consists of a band V of ivory in which are imprisoned copper dowels *m m*, to each of which are soldered two spring blades *o o* embedded in the ivory. The dowel is by the addition of those springs held firmly in the ivory, but for greater security two screws *v v* are added, which insure a perfect fixture of the dowel. To the two springs *o o* is fixed, by screws *v' v'*, a copper block J, having a hole which serves as guides to a metal rod *p*, which is integral with a rectangular copper piece *q* lodged in the dowel *m* and sliding with slight friction therein. The exterior face of rod *p* is hollowed at *a* to the same shape as the end of the usual spring jack plug *r*. A helical spring *s* surrounds the rod *p* and has its one end held by a set-screw *t* in the block J, its other end engaged in a hole *q'* in *q*, which latter with its rod *p* forms a plunger. The inner rod of *p* stops on its inward movement against a screw *u* lodged in a copper piece K. These parts constitute a switch N, which is closed to complete electrical communication between a battery and the solenoids corresponding to this switch, when the rod or key *p* is pushed into contact with the stop screw *u*. These copper pieces are also imprisoned in the ivory. On the piece K are finally screwed two bent blade springs *y y'*. The spring blades *o* and *y* extend between two spring blades *z z* in the connecting band L, and it is to these latter blades that the electrical conductors from the battery to the solenoids are soldered. Each band V holds as many dowels *m* as there are spring jacks in a band of the same size.

To each spring jack corresponds a dowel *m*, two springs *o*, a piece *q*, a block J, a block K and two springs *y y'*. The thickness of the band is the same as that for the spring jacks.

The operation is as follows: When a subscriber causes the shutter of his indicator to fall, the operator, before inserting the plug in this subscriber's jack to answer him, pushes the plug into the dowel *m*, which action pushes the plunger *p* inward, which coming in contact with the screw *u* closes the circuit of the solenoid arranged to raise the corresponding shutter. The operator then withdraws the plug and inserts it in the subscriber's jack, which may be immediately above the dowel. This action is therefore very simple and insures good working.

It will be seen that my invention provides an improvement in telephonic exchanges which can be variously availed of, and it will be understood that the invention is not limited to the precise details of construction and arrangement set forth as its preferred form, as these may be modified as circumstances dictate without departing from the essential features of the invention.

What I claim is—

1. In a telephonic system, a movable indicator in combination with an electro-magnet for restoring said indicator when actuated, an electric circuit for supplying an electric current to said magnet, an electric switch in said circuit controlling communication there-through, and a pulley operated by said magnet and engaging said indicator to move it to the restored position, whereby the operator can restore said indicator by operating said switch.

2. In a telephonic system, a movable indicator in combination with an electro-magnet for restoring said indicator when actuated, an electric circuit for supplying an electric current to said magnet, an electric switch controlling the current through said circuit, and a pulley operated by said magnet and having a stud engaging said indicator and restoring it when operated by said magnet.

3. In a telephonic system, an indicator having a swinging shutter, in combination with a rotative pulley adjacent thereto having two studs, one acting to stop its rotation and the other engaging the shutter elastically and moving it to the restored position.

4. In a telephonic system, an indicator having a swinging shutter, in combination with a rotative pulley engaging this shutter and moving it to the restored position, a chain passing over said pulley and operating it, and a solenoid operating said chain.

5. In a telephonic system, an indicator having a swinging shutter, in combination with a rotative pulley engaging this shutter and moving it to the restored position, a chain passing over said pulley and operating it, a solenoid operating said chain to move said

pulley toward the restored position, and a spring operating said chain in the reverse direction.

5 6. In a telephonic system, an indicator having a swinging shutter, in combination with a solenoid for restoring said shutter having a central tube, a core having rollers moving in said tube, a chain actuated by said core, and a pulley engaging said shutter and moved by
10 said chain to restore the latter.

7. In a telephonic system, an indicator in combination with a solenoid for restoring the same, electric conductors for supplying a cur-

rent to said solenoid, and a switch connected to said conductors and consisting of a sliding 15 piece pressed out of contact by a spring and adapted to be pressed into contact to close said circuit by the operator's plug.

In witness whereof I have hereunto signed my name in the presence of two subscribing 20 witnesses.

LOUIS ALFRED BERTHON.

Witnesses:

JULES ARMENGAUD, Jeune,
ROBT. M. HOOPER.