T. ROSATI.

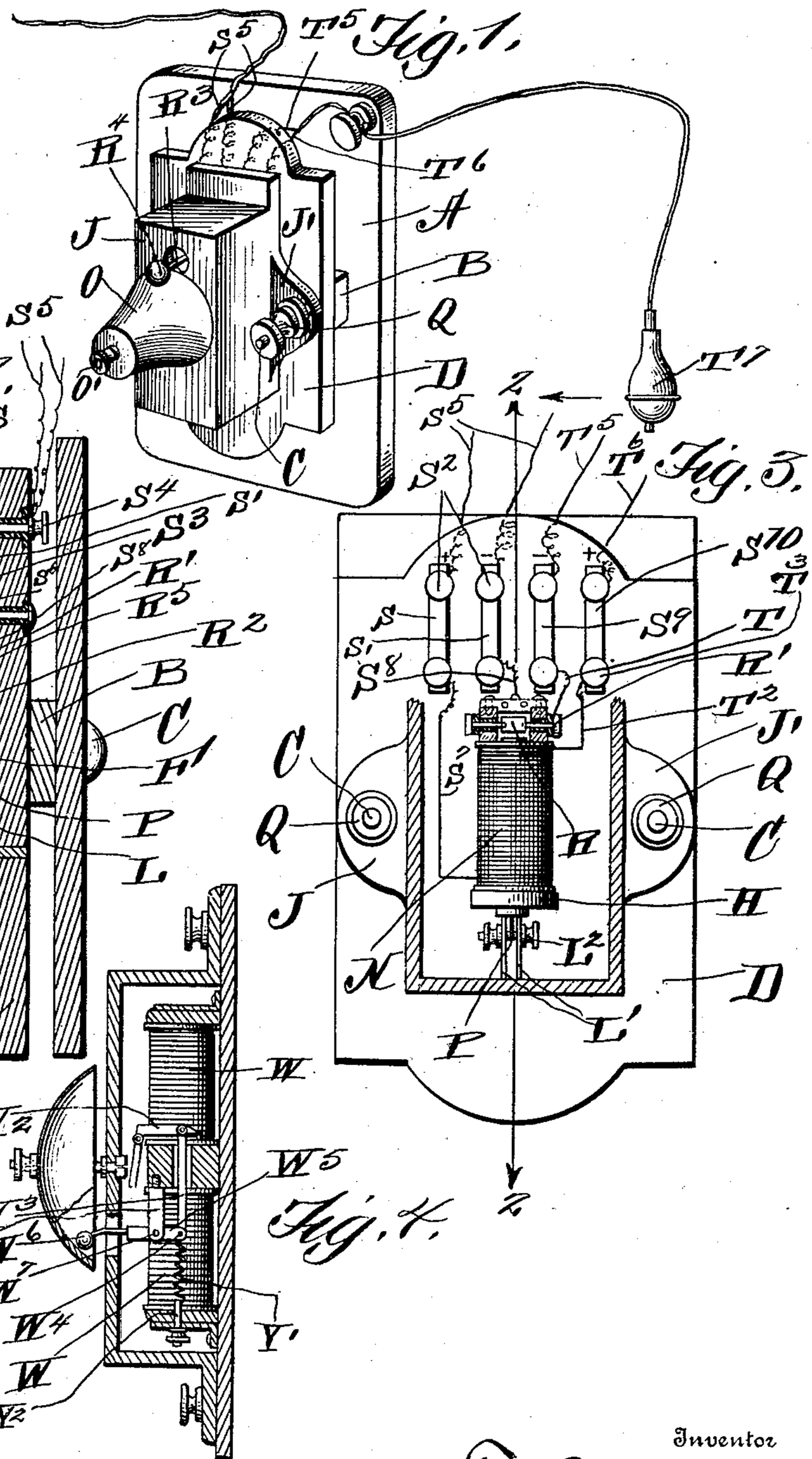
ELECTRIC BELL.

APPLICATION FILED AUG. 7, 1907.

898,686.

Patented Sept. 15, 1908.

2 SHEETS—SHEET 1.



Witnesses

R. F. Bonnell.

O. Lindmann.

Inventor

Tito Rosati

By A. L. Haught.

Attorney

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2 SHEETS—SHEET 2.

Fig. 5.

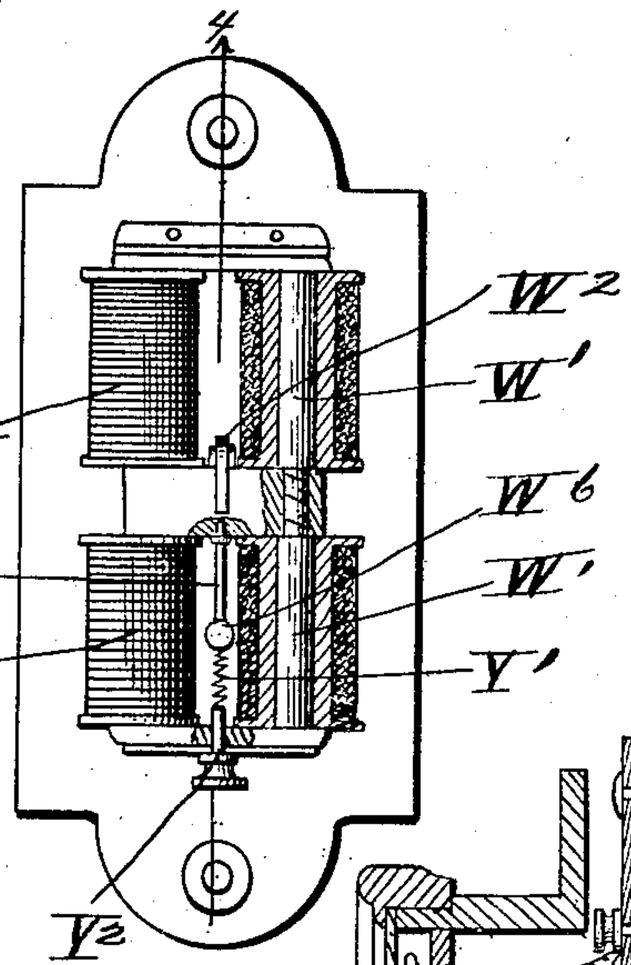


Fig. 8.

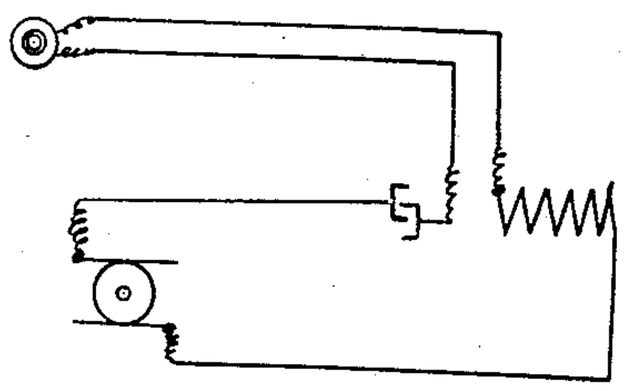


Fig. 6.

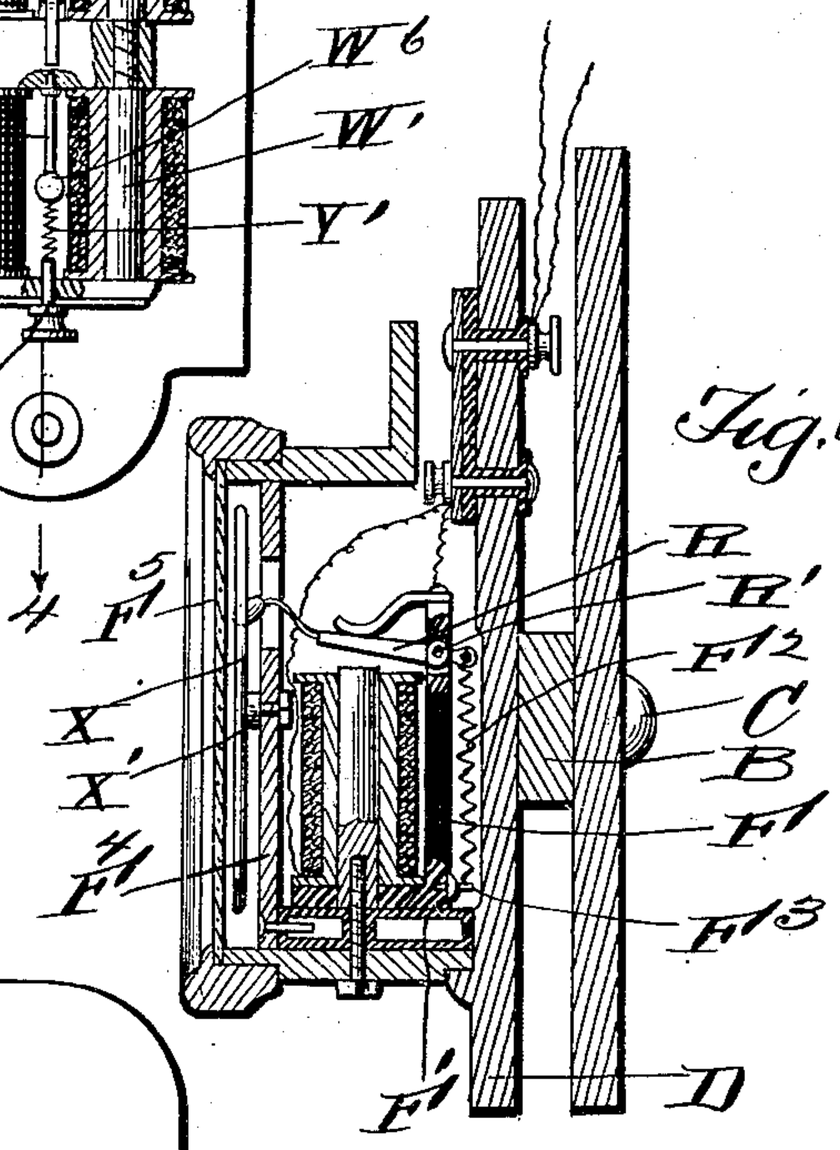
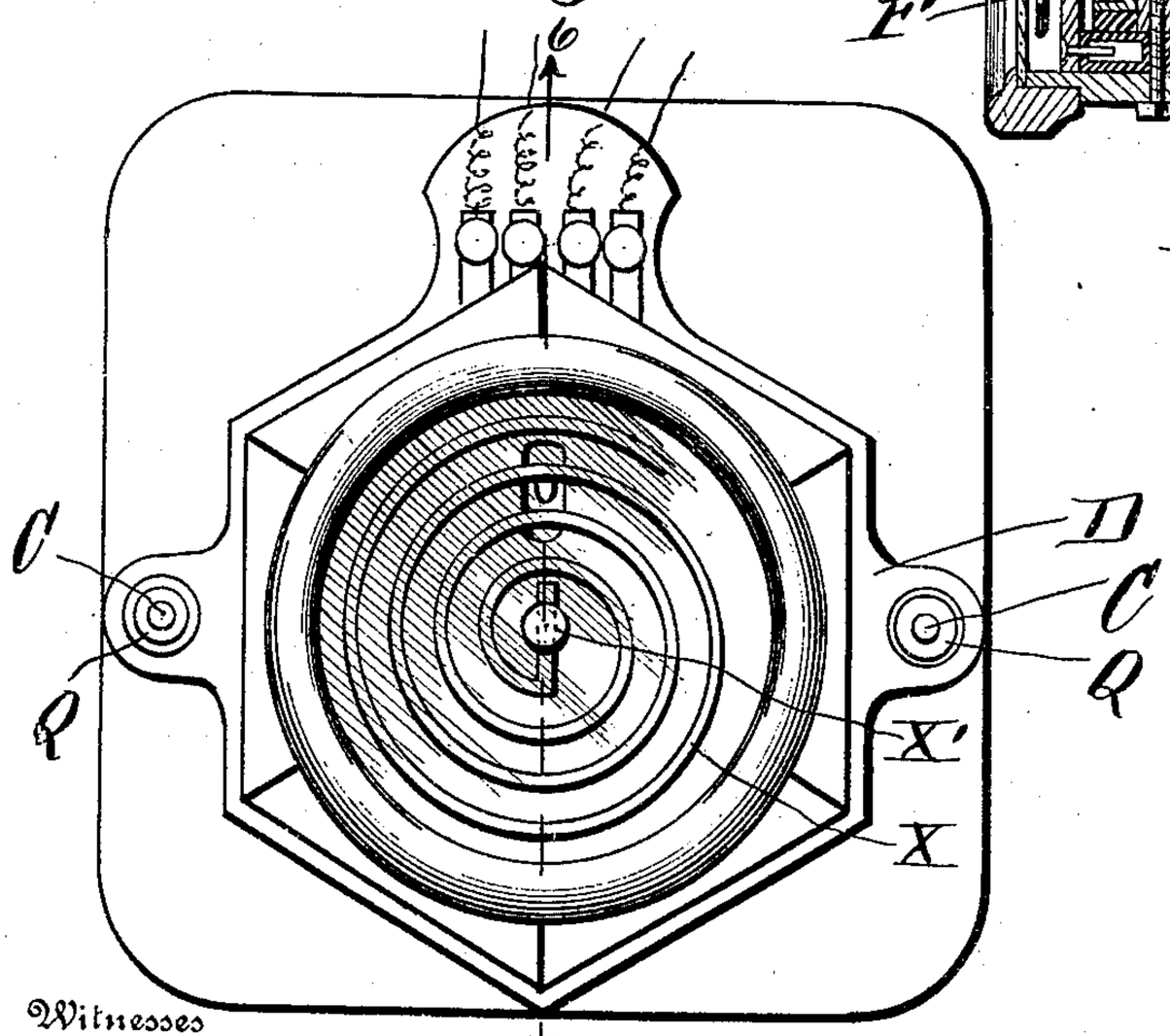


Fig. 7.



Witnesses

R. A. Brown.

B. Whitham

Inventor

Tito Rosati

By A. P. Hough,

Attorney

UNITED STATES PATENT OFFICE.

TITO ROSATI, OF FLORENCE, ITALY, ASSIGNOR OF ONE-FOURTH TO FERDINAND R. SARI AND BARTOLOMEO G. GIULIANI, OF WASHINGTON, DISTRICT OF COLUMBIA.

ELECTRIC BELL.

No. 898,686. Specification of Letters Patent. Patented Sept. 15, 1908.

Application filed August 7, 1907. Serial No. 387,466.

To all whom it may concern:

Be it known that I, TITO ROSATI, a subject of the King of Italy, residing at Florence, Italy, have invented certain new and useful Improvements in Electric Bells; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in electric bells which are operated in circuit with high potential currents of electricity, contemplating a system by which electric signals may be operated without the use of batteries and greatly reducing the expense of their operation, and comprises the utilization of resistance coils of high resistance metals, whereby high potential currents may be utilized with a centesimal fraction of amperes with a resulting consumption of only from five to ten watts per hour, according to the size and dimension of the electrophone. To accomplish this economical result respecting the consumption of power, it is necessary that the windings of the coils of the high resistance metals, which excite the magnetic force, should be calculated in a manner to obtain a sufficient number of ampere windings in order to determine the numerical quantity of lines of force.

My invention comprises various details of construction and combinations and arrangements of parts which will be hereinafter fully described and then specifically defined in the appended claims.

I illustrate my invention in the accompanying drawings, in which:—

Figure 1 is a perspective view of my bell in which but a single coil of high resistance metal is employed. Fig. 2 is a sectional view on line 2—2 of Fig. 3 looking in the direction of the arrow. Fig. 3 is a front elevation of the bell, the boxing of the same being shown in section. Fig. 4 is a sectional view on line 4—4 of Fig. 5, showing the application of the invention for use in circuits of higher potential than the construction illustrated in Figs. 1 to 3 inclusive. Fig. 5 is a view partly in section and in elevation of the modified form illustrated in Fig. 4. Fig. 6 is a sectional view showing a slight modification of the invention in which a single resistance coil is utilized, and Fig. 7 is a front elevation of the modification shown in Fig. 6. Fig. 8 is a diagrammatic view showing the electric circuit.

Reference now being had to the details of the drawings by letter, A designates any fixed object to which the bell is to be applied and is provided with a cross piece B, metal or of other material, through which the screws C pass.

D designates a plate to which the electrical apparatus is fastened and through which the screws C pass. Projecting from the plate D is a shelf E which is shown in the drawings as having a tenon entering and opening in said plate and, upon said shelf, an L-shaped member F of any suitable material, preferably of metal, is supported. Mounted upon said member F is a bobbin H having a core I of soft iron, which core has a contracted portion I′ extending through registering apertures in said shelf and member F, and a bur or nut K is fitted to the lower end of said core, which is threaded, the shoulder formed upon said core being adapted to engage the member F thereby securely holding the same in place.

N designates a winding of high resistance wire, preferably of costantan, nichelina, manganina or other similar metal having high electric resistance. An electric bell O is mounted upon a rod O′ projecting from the casing J, which latter is provided with wings J′ which are apertured to receive the screws C, and adjusting nuts Q are fitted upon the outer ends of each of the said screws C whereby the plate and casing may be held securely together.

An armature R is pivotally mounted upon a pin R′ carried by the walls of a plate R^2 of any suitable insulated material, said armature being adapted to have a vibrating movement upon its pivotal pin. Said armature has an integral arm R^3 projecting therefrom with a hammer R^4 upon its end which projects through an opening in the casing J and adapted to vibrate against the bell. A spring P is connected at the upper end to the short arm R^5 of the armature and passes through a guide eye L, which is fastened to said member F. Mounted in the bracket arms L′ underneath said shell is an adjusting screw L^2 about which the lower portion of

said spring P is adapted to wind and forms means for adjusting the tension thereof. A curved leaf spring L^3 is fixed to the top of said plate and forms a yielding stop against which said armature is adapted to contact after the circuit has been broken, said armature being drawn against the leaf spring of the spring P. Metallic conducting strips S and S′ are held to the plate D by means of the binding screws S^2, suitable insulation S^3 being interposed between said strips and the plate D and also between the screws S^2 and the latter. Finger nuts S^4 are mounted upon the upper of said binding screws and are adapted to hold the high potential wires S^5 in contact therewith, and finger nuts S^6 are mounted upon the lower of the screws S^2, one of which is adapted to fasten the high potential wire S^7 to a strip S, while to the second strip S′ a high potential wire S^8 is connected. Said wire S^7 is connected to one pole of the coil N, while the other wire S^8 is electrically connected to the spring L^3. A conductor wire T electrically connects the strip S^9 with the armature through the pivotal pin on which the latter is mounted, and T^2 designates a wire, which is connected at one end to a metallic strip S^{10} through the medium of the binding post T^3 and its other end is connected to the positive pole of the winding or high resistance coil N. T^5 and T^6 are wires, which are adapted to be connected to an ordinary push button T^7 and are connected to the minus and positive metallic strips S^9 and S^{10}.

The windings of wire on the resistance coils are preferably two-tenths of a mm. in size of costantan, nichelina, manganina or other high resistance metal, in which a resistance is offered from 0,488 ohms to 0,43 ohms, according to the particular kind of high resistance metal above mentioned which may be used. In order to obtain an advantageous effect in the dynamo magnetic coils, only a limited number of windings is necessary, but to absorb a high potential voltage in operating the bell it is necessary to adapt a wire for such windings which a comparatively few meters long would absorb the voltage. For instance, in a coil or winding of the bell, in order to absorb 150 volts with one-tenth amperes, it would require 98 meters of costantan wire, two-tenth mm. in diameter having a weight of 42 grams. When nichelina is used, it will require 110 meters and 45 grams in weight and, with manganina, 112 meters and 46 grams in weight, the last two having the same diameter, two-tenth mm., whereas to obtain the same results by use of copper wire to absorb the potential of 150 volts, it would require 3000 meters of the same diameter and having a weight of 0,800 kg. By the use of these metals of high resistance power, the weight and size of the apparatus may be no larger than the ordinary electric bell apparatus which is used in connection with batteries and of low potential.

In Figs. 4 and 5 of the drawings, I have shown a modification of the invention in which four high resistance coils are illustrated, in which high voltage currents of from 200 to 500 volts may be utilized to operate the bell. In said Figs. 4 and 5, the coils are designated by W and each is provided with cores W′ of soft iron. W^2 designates an armature which is pivotally connected to a rod W^3 which in turn is pivotally connected at W^4 to a tilting bar W^5 having a hammer W^6 at the end thereof. W^7 designates a pivot pin mounted upon the bracket Y and a spring Y′ is connected to the lower end of the rod W^3 and its other end fastened to the adjusting screw Y^2.

In Figs. 6 and 7 is shown a slight modification of the form of a bell designated by letter X and which bell is formed of a coil of wire, shown clearly in Fig. 7. The detailed construction of the apparatus shown in Fig. 5 is substantially similar to that illustrated in Figs. 2 and 3, although modified in certain details to adapt the same to the construction shown, in which the armature R is pivotally mounted upon the pin R′, said pin being carried by the member F which is supported upon an insulating block F′ and the spring F^2 is connected to the short arm of the armature and its lower end connected to a pin F^3. The bell X, mounted upon a post X′, is secured to a plate F^4 and a protecting glass F^5 covers the portion of the casing in which said bell X is mounted.

It will be noted that, by the arrangement of the apparatus as shown in the drawing, the circuit closer is positioned between the coil and the bell hammer, instead of between the source of energy and the contact post which is a common arrangement in ordinary electric bells in which low voltage currents are employed.

From the foregoing, it will be noted that, by the provision of an electric bell made as herein described and as illustrated in the accompanying drawings, a simple and efficient device is afforded, whereby high potential currents of from 100 to 500 voltage may be reduced to 3 or 4 volts, making it possible to utilize the ordinary electric bells which at present are actuated by batteries and without changing the size of the wire or other appurtenances, thereby reducing to minimum the cost of operating the bells.

What I claim is:—

1. An electric bell having a single magnetic coil of high ohmic resistance wires, a high potential wire connection with one end of the winding of said coil, a low potential wire connected to the other end of the winding of said coil, an insulated bell hammer, a circuit closer with low potential wire connections between the same and said hammer,

low potential connections between the circuit closer and coil, a circuit breaker co-acting with said hammer, and low potential wire connections between the circuit breaker and the source of energy, as set forth.

2. An electric bell having a single magnetic coil of high ohmic resistance wires, a high potential wire connection with one end of the winding of said coil, a low potential wire connected to the other end of the winding of said coil, a bracket plate and support therefor and upon which plate said coil is mounted, an insulation block fitted to said plate, a pivotal hammer mounted upon said block, a spring carried by the latter and retracting said hammer, a circuit closer with low potential wire connections between the same and said hammer, low potential connections between the circuit closer and the coil, a circuit breaker co-acting with said hammer, and low potential wire connections between said circuit breaker and the source of energy, as set forth.

3. An electric bell having a single magnetic coil of high ohmic resistance wires, a high potential wire connection with one end of the winding of said coil, a low potential wire connected to the other end of the winding of said coil, a bracket plate and support therefor upon which plate said coil is mounted, an insulation block fitted to said plate, a pivotal hammer mounted upon said block, a spiral spring connected to the hammer, a circuit closer with low potential wire connections between the latter and said coil, a circuit breaker co-acting with said hammer, and low potential wire connections between the circuit breaker and the source of energy, as set forth.

4. An electric bell having a single magnetic coil of high ohmic resistance wires, a high potential wire connection with one end of the winding of said coil, a low potential wire connected to the other end of the winding of said coil, a bracket plate and support therefor and upon which plate said coil is mounted, an insulation block fitted to said plate, a pivotal hammer mounted upon said block, a spring carried by the latter and bearing against said hammer acting as a circuit breaker, a spiral spring fastened to one end of the hammer, an adjusting screw to which said spiral spring is connected, a circuit closer with low potential wire connections between the same and said hammer, low potential connections between the circuit closer and coil, and low potential wire connections between the circuit breaker and source of energy, as set forth.

5. An electric bell having a single magnetic coil of high ohmic resistance wires, an insulated support for said coil, insulated metallic strips mounted upon the support, a high potential wire connection with one of said plates which in turn is electrically connected with one end of the winding of said coil, a low potential wire connected through one of said strips with the other end of the winding of the coil, a pivotal insulated hammer, a low potential wire having connections through one of the strips with said hammer, an insulated spring bearing against the hammer and having a low potential connection through one of said strips, and a circuit closer mechanism between the same and said hammer.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

TITO ROSATI.

Witnesses:

SPIRITO BERNARDY,

ITALO CIANI.