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PATENTED SEPT. 3, 1907.

N. FALLEK & G. F. WOLFE.
AUTOMATIC ELECTRIC GONG RINGING DEVICE FOR STREET CARS.

APPLICATION FILED APR. 22, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

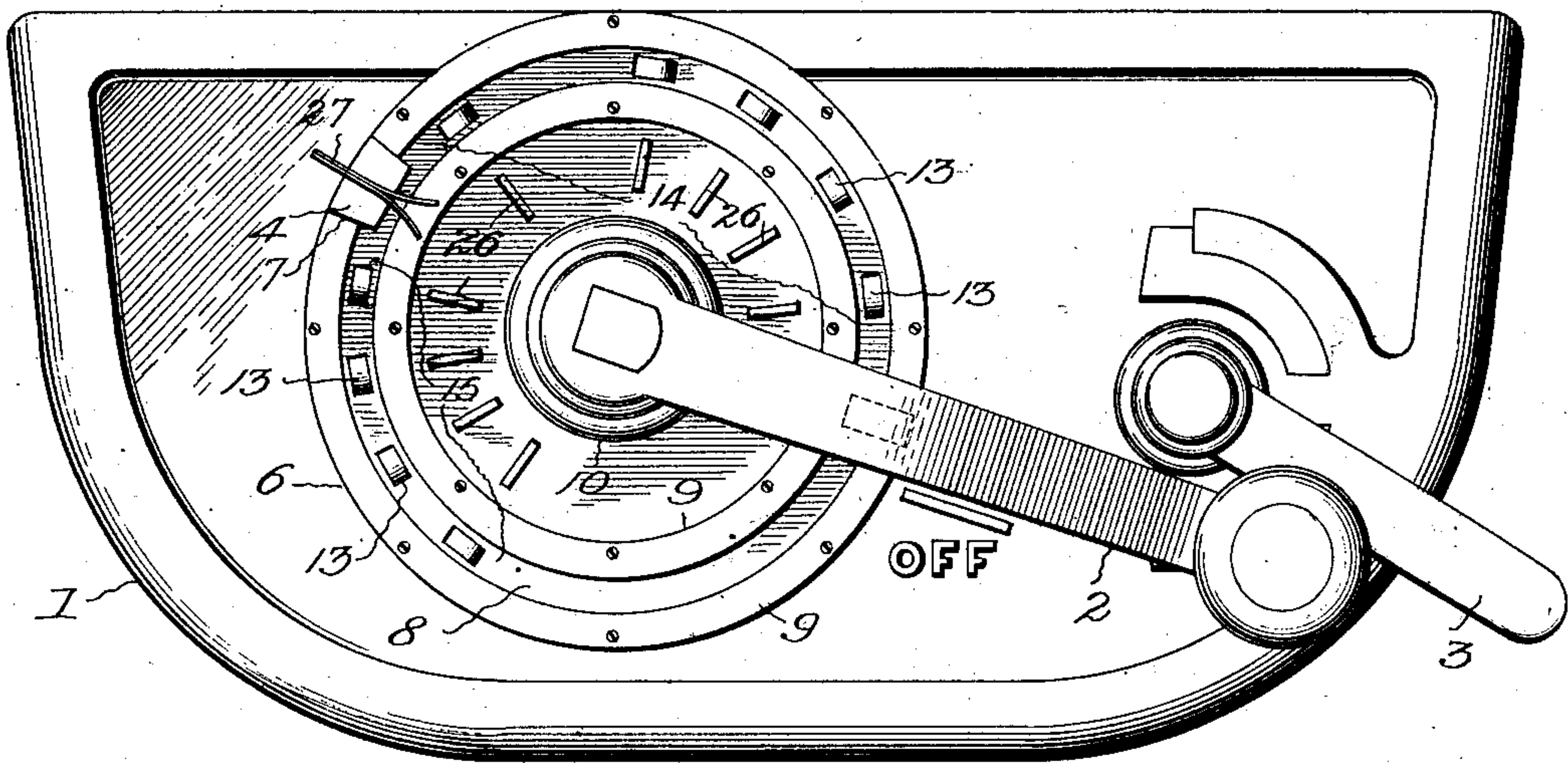
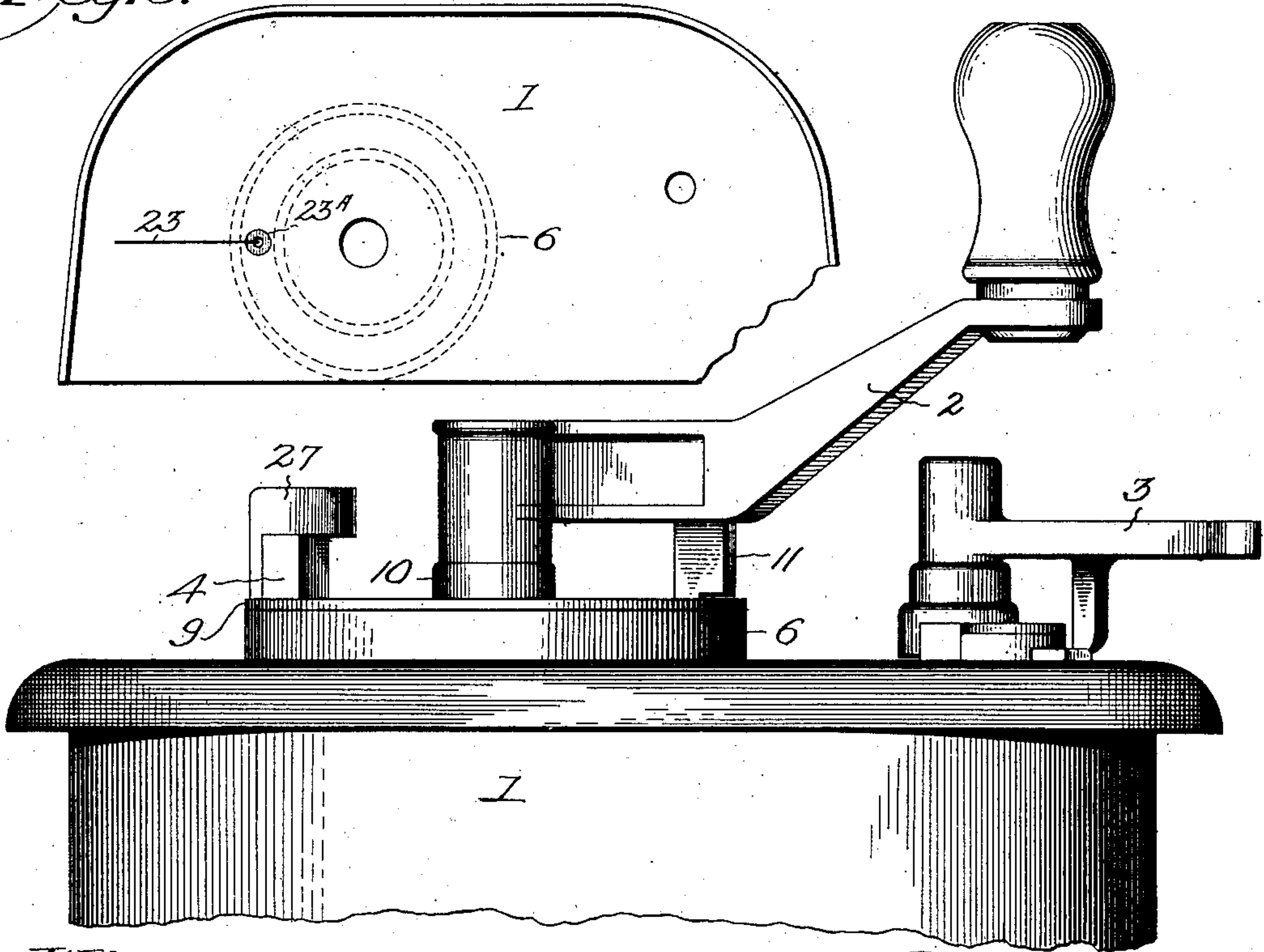


Fig. 3.



Witnesses: *Fig. 2.*

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2 SHEETS—SHEET 2.

Fig. 4.

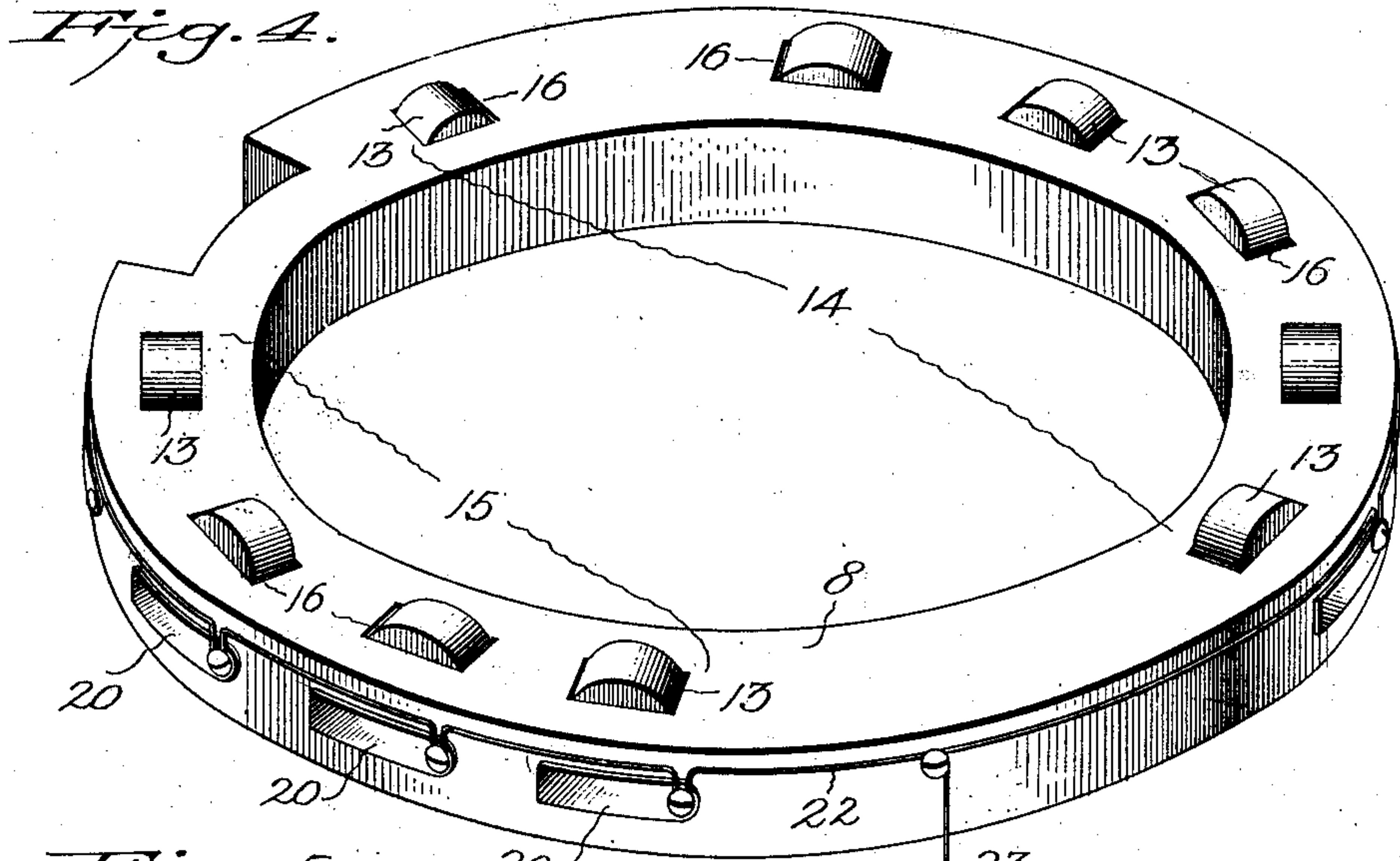


Fig. 5.

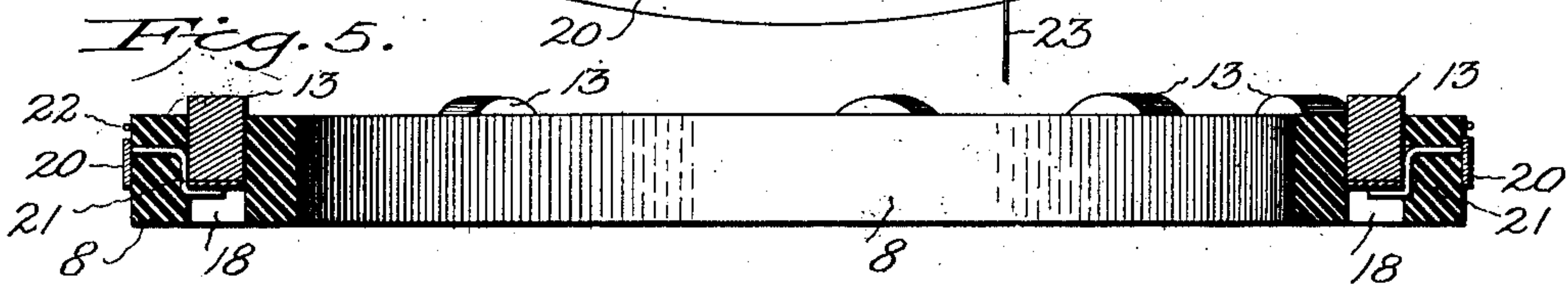


Fig. 6.

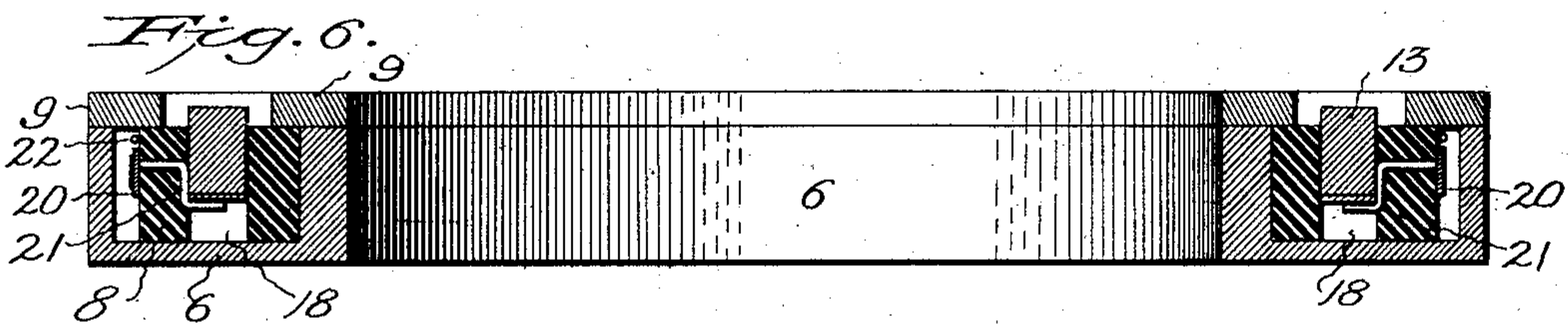


Fig. 7.

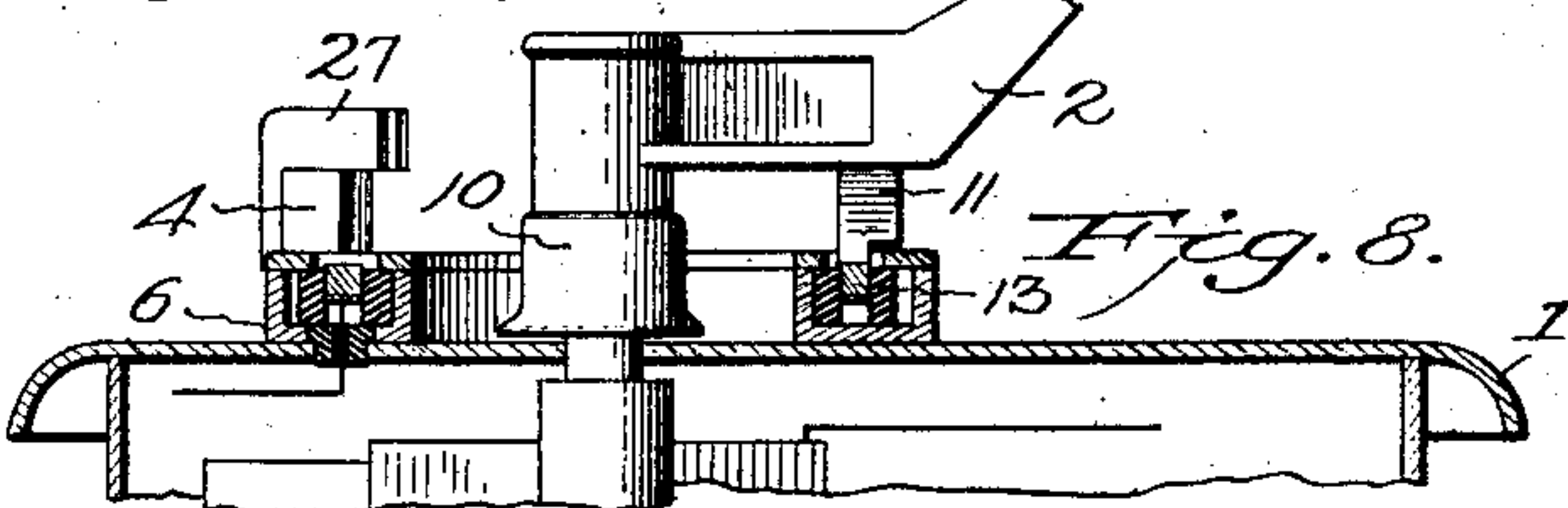
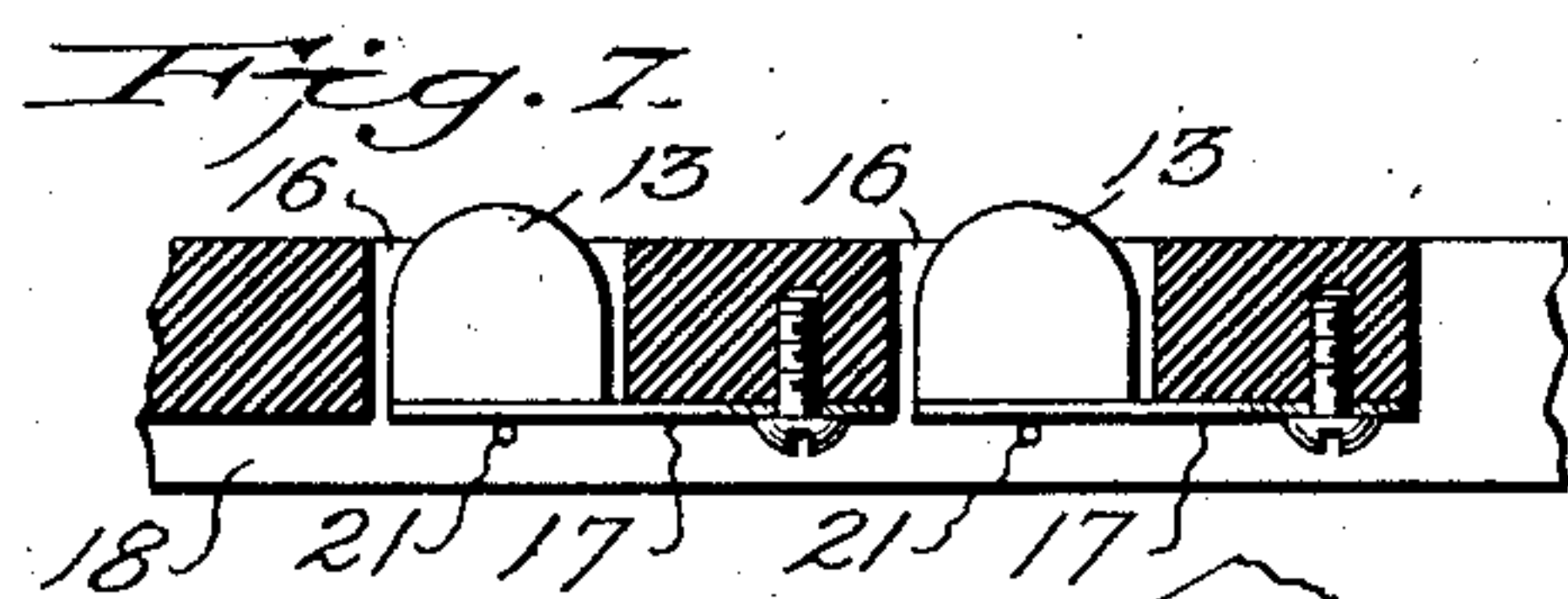
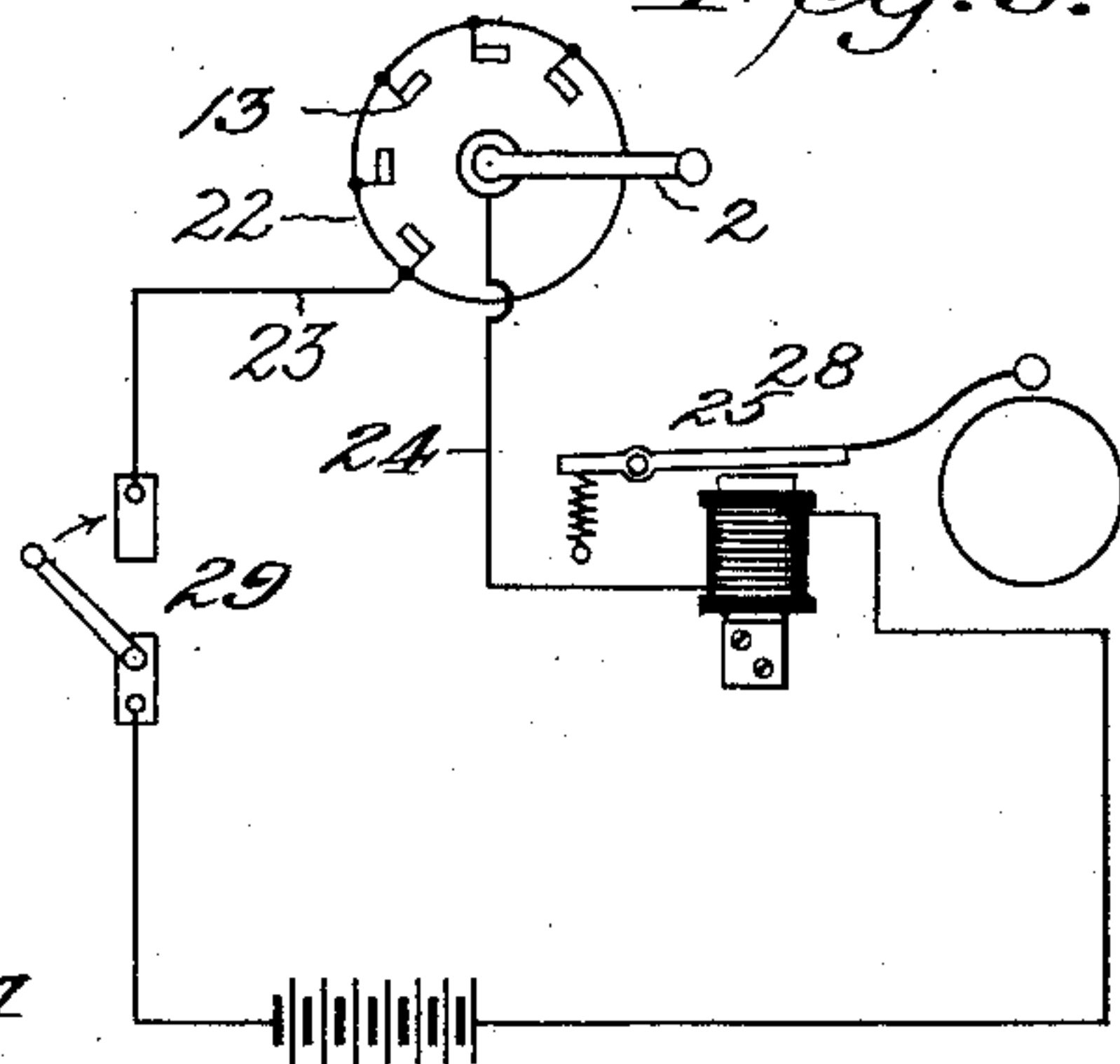


Fig. 9.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC ELECTRIC GONG-RINGING DEVICE FOR STREET-CARS.

No. 864,961.

Specification of Letters Patent.

Patented Sept. 3, 1907.

Application filed April 22, 1907. Serial No. 369,616.

To all whom it may concern:

Be it known that we, NATHAN FALLEK and GEORGE F. WOLFE, citizens of the United States of America, residing at the city and county of Denver and State of Colorado, have invented a new and useful Automatic Electric Gong-Ringing Device for Street-Cars, of which the following is a specification.

Our invention relates to an automatic electrical gong ringing device, for electrical street cars; and the objects of our invention are:—First, to provide an automatic electrically operating alarm bell or gong ringing device for street railway cars that will automatically and continuously ring the gong when a car is standing still unless the motorman holds the crank handle against the stop post of the controller, and will ring the alarm gong continuously from the time the motorman starts to turn on the current until the car has started and attained a fair rate of speed. Second, to provide an electrically-controlled automatically operating alarm gong device that will enable motormen to continuously sound an alarm whenever desired. Third, to provide an automatically-operating electrically-controlled alarm gong device that will continuously ring an alarm whenever a motorman fails to hold the switch crank against the stop post of the controller or fails to remove the controller crank from the controller when he leaves the controller. We attain these objects by the mechanism illustrated in the accompanying drawings, in which,

Figure 1, is a plan view of an electric current controller of a street railway car showing our invention applied to it. Fig. 2, is a front view of Fig. 1. Fig. 3, is a bottom plan view of the top of the controller showing the circuit wire which connects with the contacts of the gong ringer, extended through the said top. Fig. 4, is a perspective view of the non-conducting ring, having the contacts connected by a circuit wire, which is also connected to cut-outs for disconnecting any desired contact. Fig. 5, is a sectional view of the same, showing the connection between the cut-outs and the contacts. Fig. 6, is a similar view showing the said ring inclosed in a box or housing which is secured to the controller. Fig. 7, is a sectional view taken longitudinally through a fragment of the ring, showing two of the contacts secured thereto. Fig. 8, is a sectional view through the upper end of the controller, showing the ring and housing attached thereto, in position to be operated by the usual controller crank. And Fig. 9, is a diagram illustrating the circuit, including the controller, the contact supporting ring, and the gong.

Similar letters of reference refer to similar parts throughout the several views.

Referring to the drawings, the numeral 1, designates the controller box of an electrical street car, and 2 designates the controller crank of shaft of switch mechanism of the controller box.

3 designates the switch handle, and 4 designates the controller crank stop post.

The controller box and the switch shaft and crank are elements that are in common use on electric street railway cars, and they do not by themselves form any part of our invention, but are illustrated in co-operative relation with it, and we preferably arrange our invention to coöperate with them in the following manner: Concentrically around the controller shaft, we secure to the top surface of the controller a ring-shaped box 6. This ring-shaped box is provided with a recess 7, which is formed in its peripheral edge to permit the periphery of the ring to fit around the stop post 4. This box-shaped ring is made of any suitable material, and it is made to incase and hold a non-conducting ring 8, such as fiber or other suitable material, which is laid in it, and is secured in it against movement by a pair of cover rings 9, which are secured to the edges of the box, and which are adapted to lap over the edges of the box onto the fiber ring 8, but are enough narrower than the width of the box to leave a circular ring-shaped space between them.

The end of the controller shaft is provided with a square or other suitable crank receiving end portion, and the hub end 10 of the crank handle is provided with an aperture adapted to fit loosely on it, and the under side of the handle portion of the crank is provided with a depending lug 11, which I term a contact lug, and which is made to fit loosely into the slot formed between the cover rings 9. This contact lug is also made long enough to extend down into the slot in contact with or in close proximity to the fiber ring, so that as the crank handle is swung around on the controller box in throwing on and off the current, the lower end of its depending lug will be either in bearing contact with the surface of the fiber ring or close to it. This ring is provided with a plurality of circuit contact points 13, which may be arranged in any desired order and distance apart in its circumference, but which we preferably arrange in two groups 14 and 15, each group of which commences close to and on opposite sides of the stop lug and extends around the ring a predetermined distance. The group 14, of circuit contact points, we arrange on the starting side of the stop post 4, and place the first contact point so near the stop plug that the depending contact lug of the handle will contact with it when the crank handle is moved but a slight distance forward on the controller. The second contact point of this group is placed at a distance from the first contact point sufficient to enable

the operator to move the crank handle about two inches, which is simply a clearance space movement for the crank handle between the stop post and the point in the circular sweep movement of the crank handle where the current is first thrown onto the car, and from this second contact point the remaining contact points are placed at short equal distances apart for a distance of about one-half of the diameter of the fiber ring. We have illustrated six contact points in the group 14, five of which are placed between the point of throwing on the current and the point where it is about half on, and the other one is close enough to the stop post to be out of contact with the crank handle's contact lug when it is in position against the stop lug and on the controller shaft.

The group 15, as illustrated, consists of four contact points, one of which is placed near enough to the stop post 4 to be engaged by the contact lug of the crank handle at all times except when it is pressed against the stop lug, this first contact point being positioned just far enough away from the stop post to be out of engagement with the contact lug of the crank handle when it is held by the motorman against the stop post of the controller. The remaining contact points of the group 15 of the fiber ring are positioned at a short distance apart away from the stop post for a distance of about a quarter of the circumference of the ring; consequently there is a portion of the non-conductive ring that is preferably left blank and free from contact points, and this portion represents that portion of the sweep of the crank handle where the current is almost or about wholly thrown in by the crank handle, and the car is under a high rate of speed but not at full speed; and from just before the time the current is first turned on, until the car has started up and attained fairly good speed, the gong is rung continuously, as the crank handle is swung around from its starting point at the stop post, then it passes over the space between the two groups of contacts, throwing on more current, and again near the end of its full sweep it encounters the group 15 of contacts, which set the gong ringing, but as the motorman has got his car under good headway, by turning the current on gradually or by a series of short stop movements, he generally moves the controller crank to the stop post by a continuous sweeping movement, which carries it so quickly over the group 15, of contact points, that the gong does not ring much. The last contact in the group 15, of contact points, is used especially to ring the gong when the motorman through carelessness, neglects to hold the switch crank against the stop post.

The contact points of the non-conductive ring consist of substantially semi-circular shaped disks of any suitable conductive material, which extend loosely up through apertures 16, formed through the ring, and which are secured to the ends of spring blades 17, the opposite ends of which are secured to the bottom of the ring within a groove 18, so that each disk is loosely supported in its respective aperture on a spring 17 that allows it a resilient movement up and down in its aperture, and each disk is positioned so that a segment of its peripheral surface will project above the top surface of the ring and lie in the path of the lug of the controller crank. These contact points can be connected together in circuit by wires which are secured at the op-

posite ends from one to the other of these contact points around the ring, and at some convenient point a circuit wire is connected at one end to it and extends to and is connected at its opposite end to a suitable battery, as shown in Fig. 4, or to the trolley of the car in such a manner that an operative supply of current is led from the supply through the trolley and the wire to the contact points and their circuit wires. We preferably arrange these contact points, however, so that one or more of them can be cut out of circuit and from each other, so that the number of gong ringing contacts may be reduced in number if desired, in either one or in both groups of gong ringing contacts. In order to accomplish this, we provide each contact point with a switch, which consists of a swinging contact terminal spring blade 20. This spring blade is pivotally hinged at one end to the side of the ring, and a wire 21 normally contacts at one end with it, while the opposite end of this wire 21 extends to the contact point that is controlled by this switch, and preferably lies beneath and against it, as shown in Figs. 5 and 6. The pivot screws of the spring blades 20, also connect them with a circuit wire 22, which is fixed to the ring, and which extends entirely around the ring, each contact being connected to this circuit wire 22 through its switch terminal wire 21, and pivoted switch blade 20, and the wire 22 is connected by a wire 23 with a battery or with the trolley, the said wire passing down through a fiber bushing 23^A, which extends through the bottom of the housing 6 and the top of the controller.

With either arrangement of connecting the gong ringing contacts in the circuit, the circuit wire 23 is connected at one end to the circuit wire of the gong ringing disks and at its opposite end to the trolley or battery, and a circuit wire 24 is connected at one end to the controller and is extended to and connected at its opposite end to the gong ringing mechanism 25, which is an electrically operated bell of the make-and-break circuit type, after which the wire is continued to the battery or trolley, thus completing a circuit. The gong ringing disks extend far enough above the top of the non-conductive ring so that each is engaged by the switch crank in successive order as it is swung around through its operative current switching circle, and as the contact lug of the controller crank engages each contact disk its curved periphery permits it to spring down as the lug engages and is drawn over it, and the gong rings repeatedly as long as the lug is in engagement with the contact disks. And if it is desired to cut out any of the disks it is only necessary to remove the outer cap ring and swing the cut-out terminal spring blade on its pivotal center out of engagement with the wire 21.

While we have illustrated this simple method of cutting out any of the disks, our invention contemplates the use of any means for operatively cutting out the disks.

On some street car systems a controller device is used on the controller, and this device can be used in connection with our invention. It comprises an automatic ratchet and pawl device that limits the movement from moving the controller crank to a series of short movements, at the end of each of which the controller crank is stopped and has to be moved back

slightly before it can be moved ahead again; thus compelling the motorman to turn his current into the resistance of the controller in step-by-step movements of the controller crank, and the resilient contact disks are arranged in positions to be engaged by the contact lug of the controller crank at the point where the controller crank is stopped by this controller device. The controller device is arranged to automatically stop the controller crank directly over the circumferential row of radial lugs 26^A, that are formed on the controller, to indicate the proper step-by-step movement of the controller crank to turn the current into the resistance elements of the controller and as a guide for the short stop movements of controller crank in turning the current into the resistance elements of the controller, and while the contact disks may be placed at any desired distance apart, and arranged in any desired manner, we preferably place them directly over these radial guide lines and also terminate the group 14 just before the end of the resistance of the controller, at which point the controller is provided with the word "Off", to indicate the current is flowing to the motors of the car independent of the controller's resistance. We thus also provide means by which the motorman knows when he is running his car on a resistance current, as the gong will always ring continuously when the controller crank is over any of the resistance guide lines 26. Motormen are apt to run their cars on the resistance current, and by so doing soon burn out the resistance coils or elements of the controller, and one of the essential elements of our invention is to arrange the group 14 of contact disks so that the gong always rings when the car is running on the resistance current, and this enables him to move his controller crank to the indicating pointer "Off", at which point he knows the car is running by direct current that does not flow through the controller's resistance elements and consequently he knows that there is no danger of heating up and perhaps burning out the resistance of the controller.

Our automatic gong ringing device is also adapted to compel the motorman to either remove the controller crank from the controller's switch shaft when his car is standing still, or hold it continuously against the stop post or submit to a continuous ringing of the alarm gong, and also to either hold the controller crank against the stop post when his car is running at full speed or submit to a continuous ringing of the gong; consequently, one of its objects is to compel motormen to attend strictly to the proper operation of the controller crank. There are several ways in which this feature of our invention can be accomplished, but we preferably carry out this feature of our invention in the following manner: To the center of the stop post we secure the lower ends of a pair of blade springs 27, the free ends of which are arranged to be engaged by the controller crank when it is within a short distance of the stop post so that the springs will hold the controller crank far enough away from either side of the stop post to bring its contact lug in engagement with the adjacent contact disk on either side of the stop post, and thus cause the gong to ring. So when the car is standing he must either hold the controller crank continuously against the stop post and against the resilient

pressure of the springs 27, where it would be out of contact with the contact disk, or submit to a continuous ringing of the gong; and in case he leaves the controller he must remove the controller crank from the controller shaft or submit to a continuous ringing of the gong, and when the car is running at full speed he must either hold the switch crank up against the stop post continuously against the pressure of the springs 27 or submit to a continuous ringing of the gong. The springs 27, curve out laterally at their free ends, so as to engage the controller crank before it abuts against the stop post, as clearly shown in Fig. 1. The gong may be connected with the circuit cut-out 29, as shown in Fig. 9, so that when the current is shut off from the car it will be impossible to ring the gong.

The operation is as follows: The motorman on taking charge of the controller puts the controller crank on the switch shaft, and to prevent the ringing of the gong holds the crank against the stop post, and off of the adjacent contact disk. Upon receiving the signal to go ahead he moves the crank to the contact disk and continues to move it by a succession of short sharp movements to the cut-off indicating point 26. The gong commences to ring from the time he moves the crank away from the stop post and continues to ring until he has reached the cut-off point. The car which was started and got under headway by current flowing through the resistance elements of the controller is when the crank reaches the cut-off, running by current flowing directly from the trolley to the motors which at this point are connected in series. The motorman then throws the crank around to the stop post, and this portion of the crank's movement actuates the controller to throw the motors in parallel running relation, and the gong rings as the crank passes over the contact disks in the group 15 until it is pressed against the stop post, and he holds the crank by applying a slight but firm constant pressure against the crank, as the instant he releases the pressure on the crank the spring 27 will move it back in contact with the adjacent disk contact. Consequently, when running, and when occasion arises to ring the gong, he relaxes the pressure on the crank enough to allow the spring to move it in contact with the adjacent disk contact, and then presses it against the stop post when he wants it to stop, and when he wants to stop the car he makes a quick backward sweeping stroke with the crank, until he strikes the stop post, at which point he must again hold the crank against the stop post, if he wishes to prevent the gong from ringing, or he can keep the gong ringing until he is ready to start by relaxing his pressure on the crank.

Having described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In an automatic electrical gong ringing device for street cars, the combination of the controller provided with a stop post, the crank on said controller arranged to swing from one side to the opposite side of said controller, a non-conductive ring secured to said controller in the swinging path of said crank, a plurality of contact terminal points in said ring arranged at predetermined distances apart in the path of said crank and adapted to be engaged in electric circuit by said crank as it is moved over said controller, two of said contact terminals being positioned on opposite sides of said stop post and at a short distance from it, resilient means connected to said stop post and arranged to normally hold said controller

crank in contact with either one or the other of said two contact terminals that are positioned adjacent to said stop post, when said crank is moved to either side of said stop post, and an electrical gong in electric circuit with each of the contact terminals and with said crank and controller.

2. In an automatic gong ringing device for street cars, the combination with the controller provided with a stop post, a controller shaft, and a crank removably fitted to said shaft and adapted to swing from one side of said stop post to its opposite side, of a non-conductive ring secured to said controller concentric to said controller shaft, a plurality of resilient contact terminals positioned in said ring, two of which are positioned adjacent to the opposite sides of said controller stop post, a spring secured to said stop post, and arranged in the swinging path of said crank, and adapted to normally hold said crank far enough away to engage in electrical circuit either one or the other of said two contact terminals that lie adjacent to said stop post, a contact terminal point on said crank arranged and adapted to electrically engage in circuit said resilient contact terminals of said non-conductive ring, when swung through its operative switch circuit on said controller from one side of said stop post to its opposite side, and arranged to be out of contact with either one of said two contact terminals that lie adjacent to said stop post, when manually moved to compress said spring and in engagement with said stop post, and an electrically operating gong in operative electrical circuit with said contact terminal points of said non-conductive ring and with said controller and its crank.

3. In an automatic gong ringing device for street cars, the combination with the controller and its operating crank, of the non-conductive ring provided with a plurality of apertures, a conductive resilient terminal positioned in each aperture and secured to said ring, conductive wires on said ring arranged to connect said contact terminals in circuit, said contact terminals being arranged in the path of said crank's operative movement, and an operative electric alarm gong connected in circuit with said contact terminals and with said controller and its crank.

4. In an automatic gong ringing device for street cars, the combination with the operative controller and the alarm gong of a street car, of a non-conductive element secured to said controller, a plurality of independent contact terminal points on said non-conductive element arranged in any predetermined order, an operating crank on said controller arranged to move over and engage in electrical contact said contact terminals in successive order, a stop post on said controller arranged to define the operative current controlling movement of said controller, an operative alarm gong on said car, a source of electric current supply connected to said car, and operative electrical connections between said contact terminals and said gong and said controller and its crank, and means connected to said controller for normally holding said crank in electrical contact with the contact terminals nearest to said stop post at the opposite ends of its operative current controlling movement.

5. In an automatic gong ringing device for street railway cars, the combination of the car provided with an electric current supply, the controller, the stop post on said controller, and the controller crank, of the non-conductive ring arranged on said controller in the path of said crank, said non-conductive ring being provided with two groups of apertures, each group commencing on the said ring on the opposite side of said stop post, and extending around said ring in any predetermined order and arrangement, a resilient contact terminal having a curved engaging surface secured in each aperture

of each group of apertures in said ring, circuit supply wires arranged on said ring to connect said contact terminals together, a current cut-out on said ring between any predetermined contact terminal and said current supply wires, resilient means connected to said controller and arranged to normally hold said crank in contact with the contact terminal of each group of contact terminals that is nearest said stop post at the end of the operative movement of the crank, an alarm gong connected to said car, suitable circuit wires arranged to operatively connect said resilient contact terminal points, and said alarm gong, and said controller in an electric circuit, and a contact terminal on said crank arranged and adapted to engage the curved surfaces of said contact terminals as it is moved through its operative movement, and ring said alarm gong.

6. In an automatic gong ringing device for street cars, the combination with a car, provided with a current supply, a resistance controller operatively mounted on said car, provided with an operating crank, a stop post to define the operative movement of said crank, and with radial lines to define the position of said controller's different degrees of resistance, of a non-conductive ring partially embracing said stop post and secured to said controller concentric to said crank's path of operative movement, two groups of resilient contact terminals secured on said ring on either side of said stop post, one group of which extends from said stop post to the end of said controller's indicated series resistance and the other group extends from said stop post to the end of said controller's indicated parallel resistance, said group's contact terminals being separated by a space on said non-conductive ring representing the direct current non-resistance portion of said controller, a spring arranged on said stop post to engage said crank, and normally hold it in engagement with either one of the two contact terminals of said groups of contact terminals that are nearest to said stop post, circuit wires arranged in said ring and connecting said contact terminals in electric circuit, an alarm gong on said car, a source of circuit supply on said car operatively connected to said gong and said contact terminals and to said controller crank, means for cutting out any one or more contact terminals from said electric circuit, and a contact terminal on said crank adapted to engage in successive order said contact terminals as it is moved operatively on said controller.

7. In an automatic gong ringing device for street cars, the combination with the controller, its operating crank, and stop post, of a fiber ring on said controller concentric with the movement of the crank, a plurality of contacts on said ring, two of which lie adjacent to opposite sides of the post, a wire connecting said contacts with a source of electric power, a wire connecting said controller with said source of power, and a gong in the circuit thus produced, a contact on said crank in the radius of the fiber ring contacts and which is adapted to engage said contacts as the crank is turned, springs on said stop post which extend laterally therefrom to engage the crank from either side before it touches the post and cause it to engage the adjacent contact of the ring, a housing for said ring having a slotted cover through which the crank contact extends to the ring contact, and a switch connected with each contact of the ring.

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

NAT. FALLEK.
GEORGE F. WOLFE.

Witnesses:

ADELLA M. FOWLE,
BESSIE THOMPSON.