Oct. 23, 1923. 1,471,878

G. H. BICKELL

ELECTRIC GONG

Filed Oct. 13, 1919 2 Sheets-Sheet 1

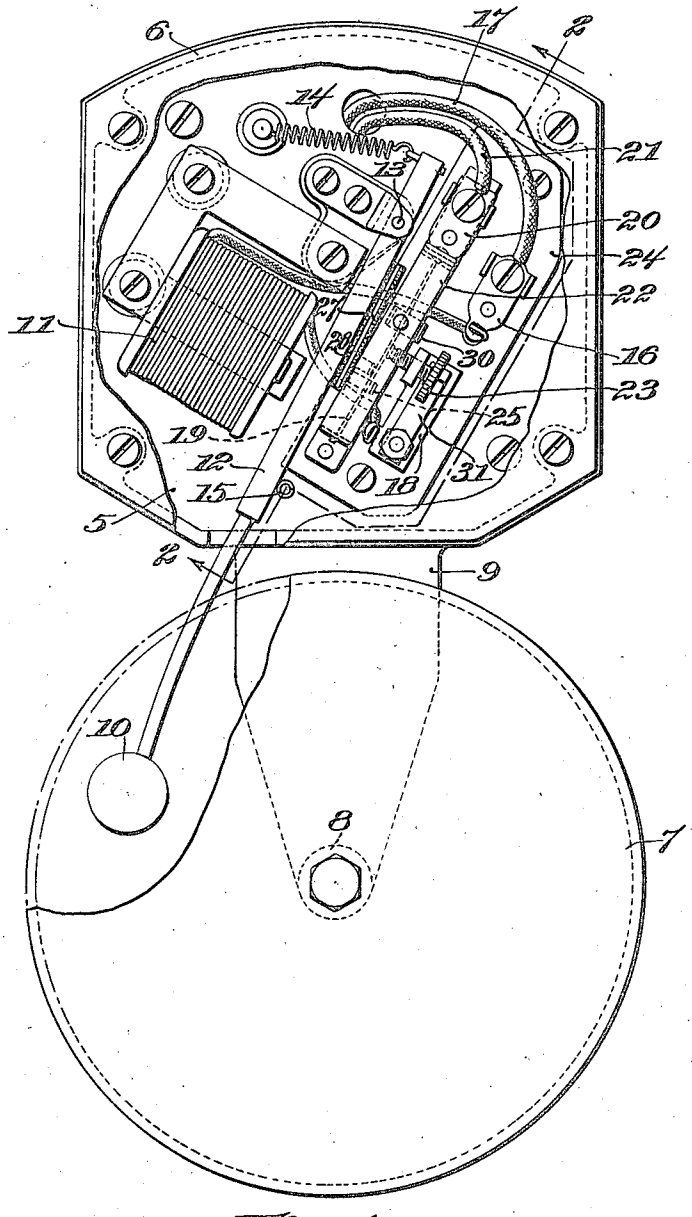



Fig. 1

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Filed Oct. 13, 1919 2 Sheets-Sheet 2

Fig. 2

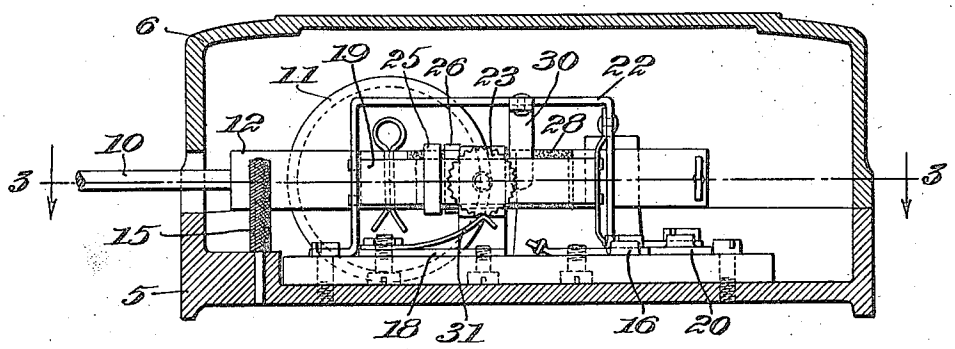



Fig. 3

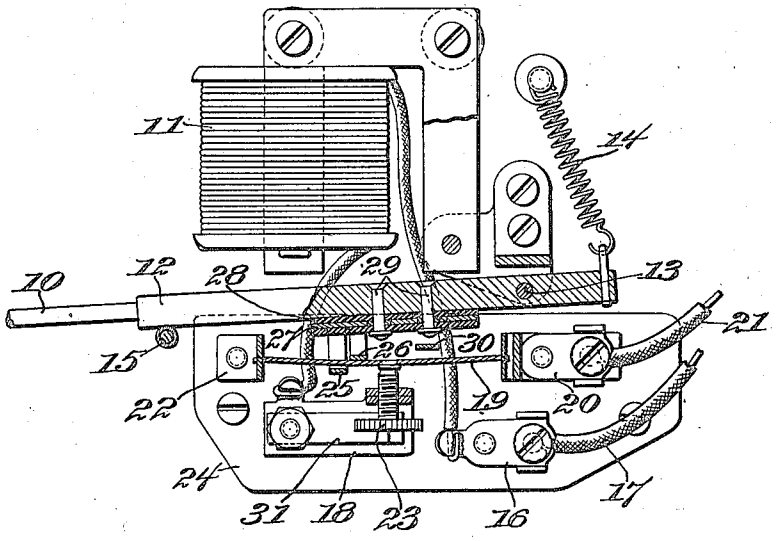
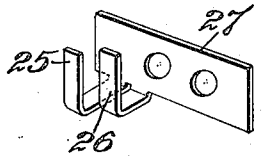



Fig. 4




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# UNITED STATES PATENT OFFICE.

GEORGE H. BICKELL, OF BROOKLINE, MASSACHUSETTS, ASSIGNOR TO THE HOLTZER-CABOT ELECTRIC COMPANY, OF ROXBURY, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

## ELECTRIC GONG.

Application filed October 13, 1919. Serial No. 330,281.

*To all whom it may concern:*

Be it known that I, GEORGE H. BICKELL, a subject of the King of Great Britain, of Brookline, residing at 363 Boylston Street, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Electric Gongs; and I do hereby 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.

The present invention relates to electrically operated gongs, and more particularly to gongs of large diameter adapted to be effectively operated by alternating current circuits of commercial frequency.

Gongs which are adapted to be operated by alternating current are ordinarily so constructed that the period of alternation of the hammer is determined by the frequency of the current. While small gongs may be satisfactorily operated in this manner, the frequency of the usual commercial alternating circuit is too great to produce effective results with large gongs since the beats of the hammer occur too rapidly to produce the desired sound.

The object of the present invention is to provide certain improvements in the construction and mode of operation of electric gongs whereby large gongs connected with commercial alternating circuits may be operated at the number of beats per minute which will give the most effective results.

To this end the invention consists in certain novel features of construction, combinations, and arrangements of parts hereinafter described and claimed, the advantages of which will be obvious to those skilled in the art.

The preferred embodiment of the invention is illustrated in the accompanying drawings in which Figure 1 is a view, in front elevation, of a gong embodying the features of the present invention, portions being broken away to disclose the interior mechanism: Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1: Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2: and Fig. 4 is a perspective view of a structural detail.

The present invention relates primarily to gongs of fairly large diameter adapted for operation by alternating current of commercial frequency (i. e. 60 cycle). It is desirable that such gongs shall be operated with a low average period of vibration which is substantially less than the frequency of alternation of the actuating current. To this end, the present invention comprises the usual actuating magnet, together with an armature forming a part of the striking hammer and means for automatically opening and closing the circuit of the magnet designed to maintain the circuit closed during a substantial portion of the movement of the hammer toward the magnet and to delay closing the circuit until the hammer has accomplished a substantial portion of this return movement away from the magnet. This feature of the invention comprises primarily two arms offset with relation to one another between which a spring contact member is received. The spring contact member is normally held in a bowed position engaging with a co-operating fixed contact, but upon the movement of the armature toward the magnet, one of the arms engages the spring contact to remove it from the fixed contact and break the circuit. Owing to the formation of the spring contact member upon engagement by the arm, it is suddenly arched away from the fixed contact, causing a quick break of the circuit without arcing at contact points. Upon the return of the hammer to initial position, the second arm engages the spring contact after a substantial period of movement and causes it to again snap into engagement with the fixed contact. With this construction, the period of vibration of the hammer is determined by the weight and inertia of the parts rather than by the frequency of the current.

In the illustrated embodiment of the invention the operative mechanism is mounted upon a base 5 and enclosed within a protective casing 6, while the gong 7 is supported upon a post 8 projecting from an extension 9 of the base. The gong is adapted to be struck upon its inner surface by a hammer 10 which is arranged to be operated by an electro-magnet indicated at 11. To this end the hammer extends from one end of an armature 12 which is pivotally mounted at

13 and is acted upon by a spring 14 which normally holds it away from the magnet and against a stop 15. The inclined arrangement of the hammer with respect to the gong is such that when the latter is set up in normal position, the pull of gravity tends to move the hammer into inoperative position. The winding of the electro-magnet is permanently connected at one end with a suitable operating switch or button (not shown) through a terminal 16 and a connection 17, while at its opposite end the winding is normally connected in the circuit through a terminal 18, a bowed or arched spring contact plate 19, a terminal 20 and a connection 21. The contact plate 19 is anchored at opposite ends to the upright sides of an inverted U-shaped bracket 22, one end of the plate being secured in a spring member attached to the leg of the bracket, as shown in Fig. 2. The plate is normally arched so that the middle of the plate is in contact with an adjustable contact screw 23 threaded in the terminal 18. The three terminals 16, 18 and 20 are conveniently insulated from each other by means of a plate 24 of insulating material which is secured to the base 5 and upon which the several parts referred to are mounted. An arm 25 connected with the armature 12 is adapted to engage the contact plate 19 when the movement of the armature toward the magnet is nearly completed and cause the plate to move out of engagement with the contact screw 23 to break the circuit through the magnet. The spring contact plate 19 then tends to arch in a direction opposite to the initial arch, breaking the circuit. The momentum of the hammer 10 causes it to complete its movement toward the magnet and it then starts to return under the influence of the spring 14 and after it has completed a substantial portion of its return movement, the bowed spring is engaged by a second arm 26 also connected with the armature, which moves the spring back against the contact screw 23 to close the circuit. The arms 25 and 26 are formed integrally with a plate 27, as shown in Fig. 4, and the plate 27 is protected on both sides by insulating strips 28 and secured to the armature 12 by means of rivets 29. An arm 30 depends from the upper portion of the bracket 22 to limit the extent of movement of the spring plate 19 toward the armature and guard against possible contact between the plate and the heads of the rivets 29.

It will be observed that with this construction, the contact is maintained for a relatively long period during the movement of the armature toward the magnet and is kept broken during the major portion of the travel away from the magnet causing the hammer to oscillate with a relatively slow beat determined by its own weight and inertia and not by the frequency of the current. By adjusting the contact screw 23, the arch of the spring plate 19 is increased or diminished and the period of alternation of the hammer may be consequently varied. In order that the adjusting screw 23 may be positively retained in its adjusted position the head of the screw is knurled and the serrations are conveniently engaged by a spring detent 31.

The construction hereinbefore described works satisfactorily without arcing at the contact points and without the tremor or fluttering incident to other gongs of this type which have been designed to operate with alternating current circuits to produce a small number of beats per minute. Moreover the improved gong is of simple and durable construction and adaptable to easy and economical manufacture.

While it is preferred to employ the specific construction and arrangement of parts shown and described, it will be understood that this construction and arrangement is not essential except so far as specified in the claims and may be changed or modified without departing from the broader features of the invention.

The invention having been described, what is claimed is:—

1. An electric gong having, in combination, an electromagnet, a movable armature cooperating therewith, an electrical circuit connected with the electromagnet, an arched contact spring included in the circuit, and a plate connected with the armature and having two arms formed integral therewith, one of the arms being adapted to flex the contact spring to break the circuit after movement of the armature a substantial portion of the distance toward the magnet and the other arm being adapted to flex the spring in the opposite direction to close the circuit upon movement of the magnet toward its original position.

2. An electric gong having, in combination, an electromagnet, a movable armature cooperating therewith, an electrical circuit connected with the electromagnet, an arched contact spring included in the circuit, a U-shaped bracket, means for holding the arched contact spring in the bracket including a spring member attached to one leg of the bracket, and a plate connected with the armature having two arms formed integral therewith, and rising on opposite sides of the contact spring, the arms being adapted to flex the contact spring in opposite directions to break and make the circuit upon movement of the armature toward and away from the magnet.

3. An electric gong having, in combination, an electromagnet, an inclined armature cooperating with the magnet, an electrical circuit connected with the electromag-

net, an arched contact spring included in the circuit, means for supporting the spring consisting of a U-shaped bracket having a spring member attached to one leg, a pair of arms connected with the armature and adapted to engage opposite sides of the contact spring to break and make the circuit upon movement of the armature toward and away from the magnet, a depending guard attached to the bracket for limiting the movement of the contact spring, and means for adjusting the initial arch of the contact spring including a knurled adjusting screw and a cooperating spring detent.

GEORGE H. BICKELL.