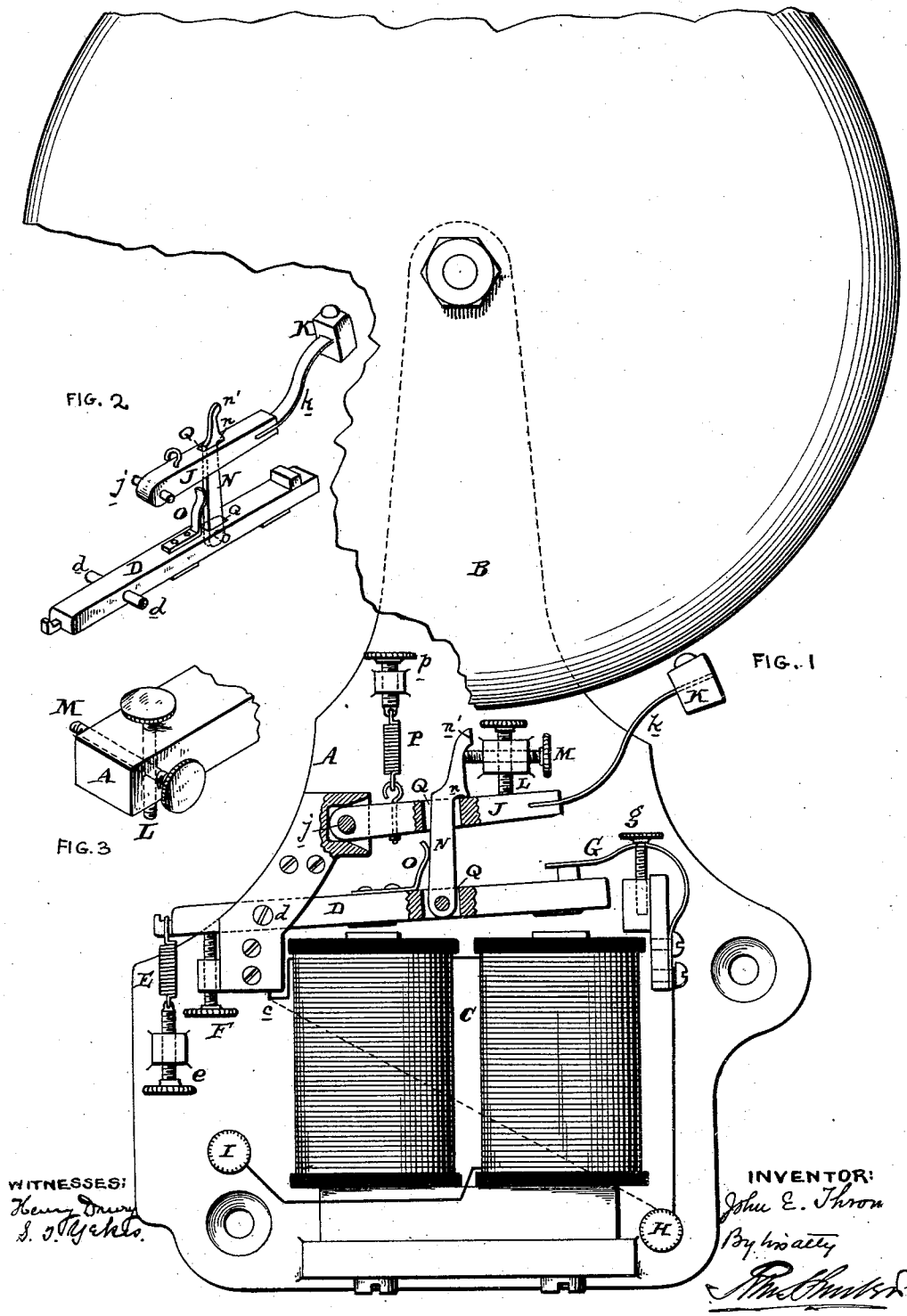
(No Model.)

J. E. THRON.

ELECTRIC BELL.

No. 484,762. Patented Oct. 18, 1892.



UNITED STATES PATENT OFFICE.

JOHN E. THRON, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRIC BELL.

SPECIFICATION forming part of Letters Patent No. 484,762, dated October 18, 1892.

Application filed June 18, 1892. Serial No. 437,177. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. THRON, a citizen of the United States, and a resident of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Electric Bells or Gongs, of which the following is a specification.

My invention has reference to electric bells or gongs; and it consists of certain improvements which are fully set forth in the following specification, and shown in the accompanying drawings, which form a part thereof.

The object of my invention is to provide a simple construction adapted to electric bells or gongs of preferably large size whereby high-striking speed may be maintained with a slower speed of armature movement.

In carrying out my invention I combine the armature of the electro-magnets with a secondary lever carrying the striker or hammer upon a flexible arm, spring actuated in one direction and drawn away in the other direction under the action of a trip-pawl controlled by the moving armature. By this construction the action of the hammer or striker is quick and produces a sharp, clear, ringing sound from the bell.

The details of construction are fully set out hereinafter.

In the drawings, Figure 1 is an elevation of an improved electric bell. Fig. 2 is a perspective view of the striking mechanism, and Fig. 3 is a perspective view of the adjustable stop and trip.

A is the main frame of the bell and is formed of metal and of any shape desired. To this frame is secured the bell B, preferably at the upper portion thereof.

C are the electro-magnets of usual construction—that is to say, preferably horseshoe in shape—and are secured to the frame A near its lower part.

D is the armature, and is pivoted to the main frame at *d*, and is adapted to be moved in one direction by a spring E, the tension of which may be adjusted by a screw *e*.

F is a back-stop designed to limit the distance the armature moves away from the electro-magnets.

G is a spring-contact carried by the main frame and is adjustable by means of a screw *g*. The electric circuit enters the binding-post H from the line, passes through the spring-contact G, thence to the armature D, and by connection *c* with the electro-magnet C, and finally to the other binding-post I. It will now be evident that the armature D will be caused to vibrate rapidly if the external circuit is closed, for when the armature is in the position shown the circuit is closed through the electro-magnets C, and is interrupted when the armature is attracted toward the electro-magnets, permitting the spring *e* to return the armature to its original position and to repeat this operation indefinitely.

J is a pivoted arm arranged above the armature D and pivoted at *j* to the main frame A. The free end of this arm is provided with a flexible arm *k*, carrying upon its extreme end a hammer K, which is adapted to strike the bell B. The lever-arm J is pulled upward or away from the armature by means of a spring P, the tension of which may be adjusted by a screw *p*, and the upward movement of the said lever-arm J is limited by the adjustable stop L. The armature D and the lever-arm J are slotted, as at Q, and in the slot of the armature D is pivoted the upwardly-extending trip N, which projects through the slot Q in the lever-arm J, and is provided with a shoulder *n* and a cam-face *n'*. The shoulder *n* is adapted to catch over the edge of the slot Q, so that when the pawl N is drawn down by the armature it pulls the armature J with it. As it descends the cam-face *n'* moves in contact with the adjustable screw M, causing the pawl N to be drawn backward against the action of a spring O of the armature, so as to liberate the lever-arm J during the downward motion of the armature and pawl, so as to permit the arm J to be pulled up rapidly against its stop L and cause the hammer K to strike the bell B.

It will be observed that all of the parts are nicely adjustable, so that the apparatus may set to work accurately and control the relative time of movement of the various parts. The armature may move through a different arc than the arm J and may have a different velocity, as the parts are relatively independent except during a portion of the downward movement of both. It will be seen that the hammer K may return and strike the bell during the downward motion of the armature D

and permit the arm J to be in the proper position upon the upward movement of the pawl N, so as to be again caught upon the return downward movement of the said armature. By this construction the hammer does not retard the vibration of the armature, and permits the bell to be operated rapidly, and also with a strong striking blow, without producing undue vibration of the parts controlling the electrical circuit. The back vibration of the hammer has no effect whatever upon the movements of the armature, and consequently does not interfere with the contacts thereof. By passing the pawl N up through a slot in the arm J it is firmly held in position against accidental displacement, and at the same time transmits its force directly in the middle of the said arm, insuring better wear of the parts and less binding upon the armature. By pivoting the said pawl N centrally with respect to the armature D the strain upon the pivot *d* is maintained uniform and greater durability is insured to these parts.

If the bell is designed to be rung intermittently or as a striking gong in place of a vibrating bell, it is only necessary to adjust the springs G and E, so as to never break the contact with the armature D or to simply connect the binding-face H with the main frame or terminal of the electro-magnets at *c*, as indicated in dotted lines. Under this condition the armature D will be drawn down upon the closing of the external circuit and will remain down until the external circuit is broken. By this means the downward movement of the armature insures a positive striking of the bell by the hammer irrespective of the time of return of the armature.

The details of construction may be modified without departing from the principles of my invention.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electric bell, the combination of the main frame, the bell, an electro-magnet, an armature operated by the electro-magnet, a circuit-interrupter controlled by the armature for interrupting the circuit through the electro-magnet, a pivoted arm having a hammer flexibly connected thereto at its free end, a spring to move the arm away from the armature, a stop to limit the movement of the hammer toward the bell, a trip between the armature and pivot-arm whereby the movement of the armature toward the electro-magnet moves the pivot-arm from the bell, a spring to press the pivot-arm into locking position, and a cam device between the pivot-arm and main frame for operating the trip device to cause it to release the pivoted arm and hammer from the action of the armature and permit it to be drawn toward the bell by the spring.

2. In an electric bell, the combination of the main frame, a bell, an electro-magnet, an armature operated by the electro-magnet, binding-posts upon the main frame, an electric circuit extending between the binding-posts and including the electro-magnet, a pivoted arm having a hammer flexibly connected thereto at its free end, a spring to move the arm away from the armature, a stop to limit the movement of the hammer toward the bell, a trip between the armature and pivot-arm whereby the movement of the armature toward the electro-magnet moves the pivot-arm away from the bell, a spring to press the pivot-arm into locking position, and a cam device between the pivot-arm and main frame for operating the tripping device to cause it to release the pivot-arm and hammer from the action of the armature and permit it to be drawn toward the bell by the spring.

3. In an electric bell, the combination of the main frame, a bell, an electro-magnet, an armature operated by the electro-magnet, binding-posts upon the main frame, an electric circuit extending between the binding-posts and including the electro-magnet, a pivot-arm having a hammer flexibly connected thereto at its free end, a spring to move the arm away from the armature, a stop to limit the movement of the hammer toward the bell, a trip between the armature and pivot-arm whereby the movement of the armature toward the electro-magnet moves the pivot-arm away from the bell, a spring to press the pivot-arm into locking position, a cam device between the pivot-arm and main frame for operating the tripping device to cause it to release the pivot-arm and hammer from the action of the armature and permit it to be drawn toward the bell by the spring, and means to adjust the time of action of said cam device for the purpose of liberating the hammer at different times relatively to the movement of the armature toward the electro-magnet.

4. In an electric bell, the combination of a main frame, an electro-magnet carried thereby, an armature pivoted thereto and operated by the electro-magnet, a bell, a pivot-arm carrying a hammer upon its end to strike the bell, means to move the hammer toward the bell, a stop to limit the movement of the hammer toward the bell, a pivoted pawl carried by the armature and extending up through a slot in the pivoted arm and having its end provided with a cam-face, a spring to press the pawl into locking position with the pivot-arm, and an adjustable part over which the cam moves for the purpose of controlling the action of the pivoted trip to release the pivot-arm carrying the hammer.

In testimony of which invention I have hereunto set my hand.

J. E. THRON.

Witnesses:
JOHN L. RICKETTS,
ERNEST HOWARD HUNTER.