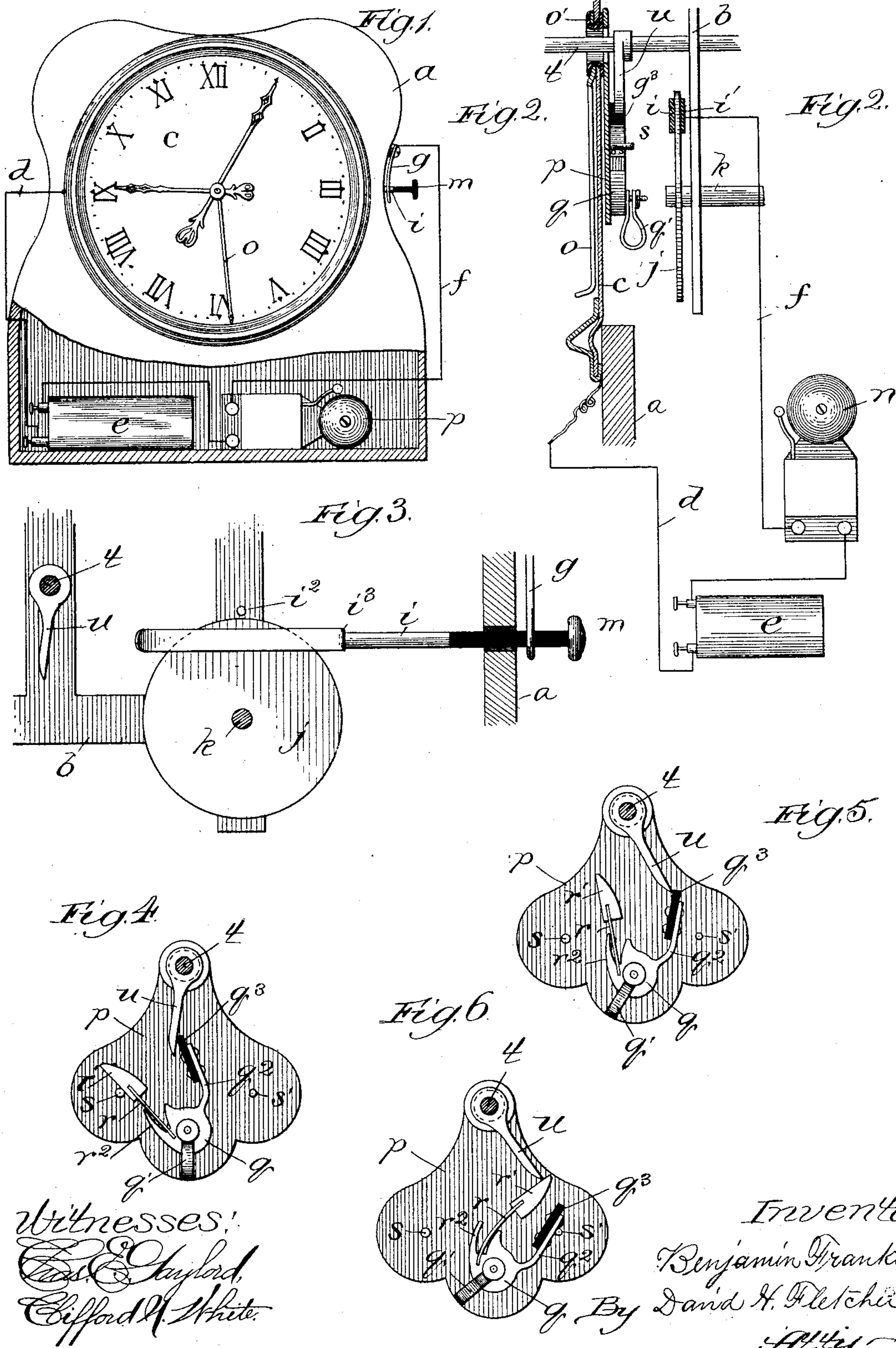


(No Model.)

B. FRANKLIN.
ELECTRIC ALARM CLOCK.

No. 477,206.

Patented June 21, 1892.



UNITED STATES PATENT OFFICE.

BENJAMIN FRANKLIN, OF CHICAGO, ILLINOIS, ASSIGNOR OF THREE-FOURTHS
TO DAVID H. FLETCHER, CALVIN R. BEACH, AND GEORGE H. MERRIELL,
OF SAME PLACE.

ELECTRIC ALARM-CLOCK.

SPECIFICATION forming part of Letters Patent No. 477,206, dated June 21, 1892.

Application filed September 12, 1891. Serial No. 405,493. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN FRANKLIN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electric Alarm Attachments for Clocks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a front elevation of a clock embodying the features of my invention, the base being partly in section to show the battery and bell. Fig. 2 is a vertical sectional view of the clock-works, in which the battery and gong are shown, with their electrical connections, in diagram. Fig. 3 is an enlarged detail view, partly in section, of a portion of the clock-frame, showing my improved circuit maker and breaker. Fig. 4 is a rear view of the plate upon the back of the dial, showing my improved circuit-closing mechanism. Fig. 5 is a like view showing the parts in a different position, and Fig. 6 is a like view showing the parts in still different relative positions.

Corresponding letters of reference in the different figures indicate like parts.

The general object of my invention is to provide an electric alarm mechanism which may be cheaply and simply constructed and readily applied to clocks without necessitating a change of construction in the latter.

A further object is to render said alarm mechanism in a measure automatic, whereby it may require no winding or other attention to enable it to sound an alarm at a predetermined time. Moreover, I desire to so construct said alarm that it may be set in the most simple manner and caused to act for an indefinite period after the time at which the alarm commences to sound, unless the electric circuit is sooner broken by the act of the user, all of which is hereinafter more particularly described and claimed.

Referring to the drawings, *a* indicates an ordinary clock-case, within which is placed the frame *b* for the support of the usual clock mechanism. The dial *c*, which is formed from sheet metal, is connected by means of a wire *d*, Figs. 1 and 2, with one pole of a battery *e*, which by preference is located and made to

conform to the space within the base of the clock. To the opposite pole of the battery is attached a wire *f*, which is connected with a switch, the swinging arm *g* of which (see Figs. 1 and 3) is adapted to be brought into contact with or separated from a metallic rod *i*, one end of which is adjusted to project through and slide loosely within the case *a* of the clock, while the other is in frictional contact with a metal disk *j*, mounted upon the winding-arbor *k*. The rod *i* is split or forked at the end, which is connected with the disk *j*, forming springs *i'* *i''*, which clamp the disk with a slight frictional contact. The object of thus connecting the disk and rod is to enable the former by its rotation to slide the rod outwardly a given distance for the purpose of closing an electric circuit, as hereinafter stated. A pin *i*², Fig. 3, serves to prevent the bar from being lifted up and thrown out of contact with the disk as the latter is rotated, while a stop *i*³ serves to limit the outward movement of the rod. Upon the outer end of the rod *i* is a knob *m*, formed from vulcanite or other insulating material, a portion of which is flush with the rod, so that as the whole is moved back and forth the spring or arm *g* of the switch is in frictional contact either with the metal or insulating material. The usual electric bell *n* is interposed in the electric circuit, as clearly shown in Figs. 1 and 2. The clock-dial *c* is separated in the usual way from the frame *b*, and hence the electric circuit is normally open. An alarm-hand *o*, Figs. 1 and 2, is loosely attached to the dial by means of an eyelet *o'*, Fig. 2, which connects said hand with a metal plate *p* upon the back of the dial and in frictional contact therewith. Upon the plate *p*, Figs. 2, 4, 5, and 6, is pivoted a collar *q*, which is held in frictional contact with the plate *p* by means of a spring *q'*, thus enabling said collar to maintain any given position in which it is placed. An arm *q*² is rigidly attached to or formed upon the collar *q* and is provided with an insulating plate or point *q*³ upon its extremity. A light spring *r* is also attached to said collar, to the end of which is attached a metal block *r'* of a sufficient weight that when the spring is bent and suddenly released the momentum of the weight

r' will overcome the friction of the collar upon the plate p and move the whole in the direction of the recoil. An arm r^2 is preferably provided upon the collar q , with which the spring is brought into contact in its recoil, thus giving the weight in its movement a more positive action upon the collar. Stops s s' serve to limit the oscillatory movement of the arms and collar q .

Attached to the hour-hand arbor t is a radial arm u , which is adapted to engage in turn with the insulated point q^3 of the arm q^2 and also with the weighted block r' , which is intended as an electric contact-point and is normally in the position shown in Fig. 4. The object of these two pointed arms—one insulated and the other not—is to enable the electric circuit to be closed automatically once in twenty-four hours by the revolution of the hour-hand arbor without the interposition of extra gears or other mechanism. The hand o and plate p are rigidly attached to each other and are relatively so adjusted that when the hand o is placed upon a given hour the arm u is brought into contact with the point r' at that time. Assuming the point r' to be in its normal position, as shown in Fig. 4, the first revolution of the hour-hand arbor causes the arm u to engage the insulated point q^3 and move it from the position shown in Fig. 4 to that indicated in Fig. 5, where it remains for the next twelve hours. At the end of that time the arm u is brought into contact with the point r' , when the electric circuit is closed and the alarm is sounded until the point r' slips off from the end of the arm u or until the circuit is otherwise broken, as hereinafter stated. The pressure of the arm u bends the spring r , and as soon as the point r' leaves the end of the arm the recoil of the spring throws said weighted contact-point in an opposite direction with such force that its momentum overcomes the friction of the collar q and moves the same until the point r' is returned to its normal position, as shown in Fig. 1. Thus it will be seen that with every second revolution of the hour-hand a contact is made with the point r' , and when released said point is automatically returned by its own momentum to its initial position, which movement may be repeated indefinitely.

When constructed as shown, it is obvious that the arm u and point r' are liable to remain in contact for several minutes, during which time the alarm is caused to sound. By pushing in the rod i so that the spring g is in contact with the insulated portion of the knob the circuit is broken and remains so until the point r' is released; but before another revolution of the hour-hand the winding arbor k will have moved sufficient to push out the rod i far enough to again bring said rod in contact with the spring g , and thus enable the circuit to be again closed when the parts u and r' are in contact. The advantage of this construction is that the alarm may be caused to sound for a long time if necessary,

or it may be stopped at will by breaking the circuit in the manner stated. If from any cause it is desired to prevent the alarm from sounding at all, the spring or switch g may be moved laterally out of contact with the rod i or the insulating material thereon.

My improved device may be readily attached to any clock without changing its construction.

Having thus described my invention, I claim—

1. The combination, with a clock, of a battery electrically connected with the hour-hand arbor and dial, respectively, an electric bell interposed in circuit therewith, a movable alarm-hand having a metallic connection with the dial, contact-points in the rear of said dial, arranged to move in unison with and to bear a fixed relation thereto, and an arm upon the hour-hand arbor in operative proximity to said contact-points, substantially as shown and described.

2. The combination, with a clock, of a battery, means for electrically connecting the same with the hour-hand arbor and dial, respectively, an electric bell interposed in circuit with said battery, an alarm-hand in connection with said dial, a circuit maker and breaker located behind and in metallic connection with said dial, an arm or contact-point upon the hour-hand arbor, adapted to engage therewith, a disk mounted upon the winding arbor, a sliding rod in contact therewith in normal circuit with the battery, and an insulating device upon said rod, whereby a change of position thereof may make or break said electric circuit, substantially as shown and described.

3. The combination, with a clock having a battery and electric bell normally in circuit with the dial and hour-hand arbor thereof, of an oscillatory circuit maker and breaker in frictional contact with the dial and provided with radial arms, one of which is insulated at its end and the other of which consists of a metallic weight mounted upon a spring, means for limiting the oscillatory movement of said device, an arm upon the hour-hand arbor in operative proximity to said arms, and an alarm-hand in metallic connection with said dial, substantially as shown and described.

4. The combination, with a clock having a battery and electric bell normally in circuit with the dial and hour-hand arbor thereof, of an alarm-hand rigidly connected with a plate in metallic connection with the back of the dial-plate, an oscillatory circuit-making device, as described, in frictional contact with said plate, and a metallic arm mounted upon the hour-hand arbor and in operative proximity to said circuit making and breaking device, substantially as shown and described.

5. The combination, with a clock having a battery and electric bell normally in circuit with the dial and hour-hand arbor thereof, of the alarm-handle o , revoluble plate p in metallic contact with the dial, collar q in resil-

ient frictional contact with said plate, insulated point q^3 and weighted metallic point r' , attached to said collar, substantially as set forth, means for limiting the oscillatory movement of said collar, and arm u in operative proximity to said points q^3 and r' , substantially as specified.

6. The combination, with a clock having its dial and hour-hand arbor in electric circuit with a battery and bell, of an alarm-hand, a revoluble plate connected therewith and with the dial, an oscillatory circuit making and breaking device pivotally mounted upon said plate, provided with two contact-points projecting radially from its axis, one of said contact-points being insulated and the other consisting of a metallic weight connected with its axis by a spring, and means for maintaining said axis in frictional contact with said plate, stops for limiting its movement, and an arm arranged to engage said points, respectively, as the hour-hand arbor is revolved, substantially as shown and described.

7. The combination, with a clock, of a battery, means for electrically connecting the same with the hour-hand arbor and dial, re-

spectively, an electric bell interposed in circuit with said battery, an alarm-hand attached to said dial, an oscillatory circuit-maker in connection with said dial, an arm upon said hour-hand arbor, adjusted to engage with and actuate said circuit-maker, a disk mounted upon the winding-arbor, a sliding rod in frictional contact therewith and having an insulating material upon its outer end, and the contact-spring g , substantially as specified.

8. The combination, in an electric alarm attachment for clocks, of the disk j and rod i , the latter being provided with insulating material upon its outer end, whereby the rotation of said disk may tend to maintain said rod normally in circuit with the battery, substantially as specified.

In testimony whereof I have signed this specification, in the presence of two subscribing witnesses, this 20th day of August, A. D. 1891.

BENJAMIN FRANKLIN.

Witnesses:

D. H. FLETCHER,
C. R. BEACH.