

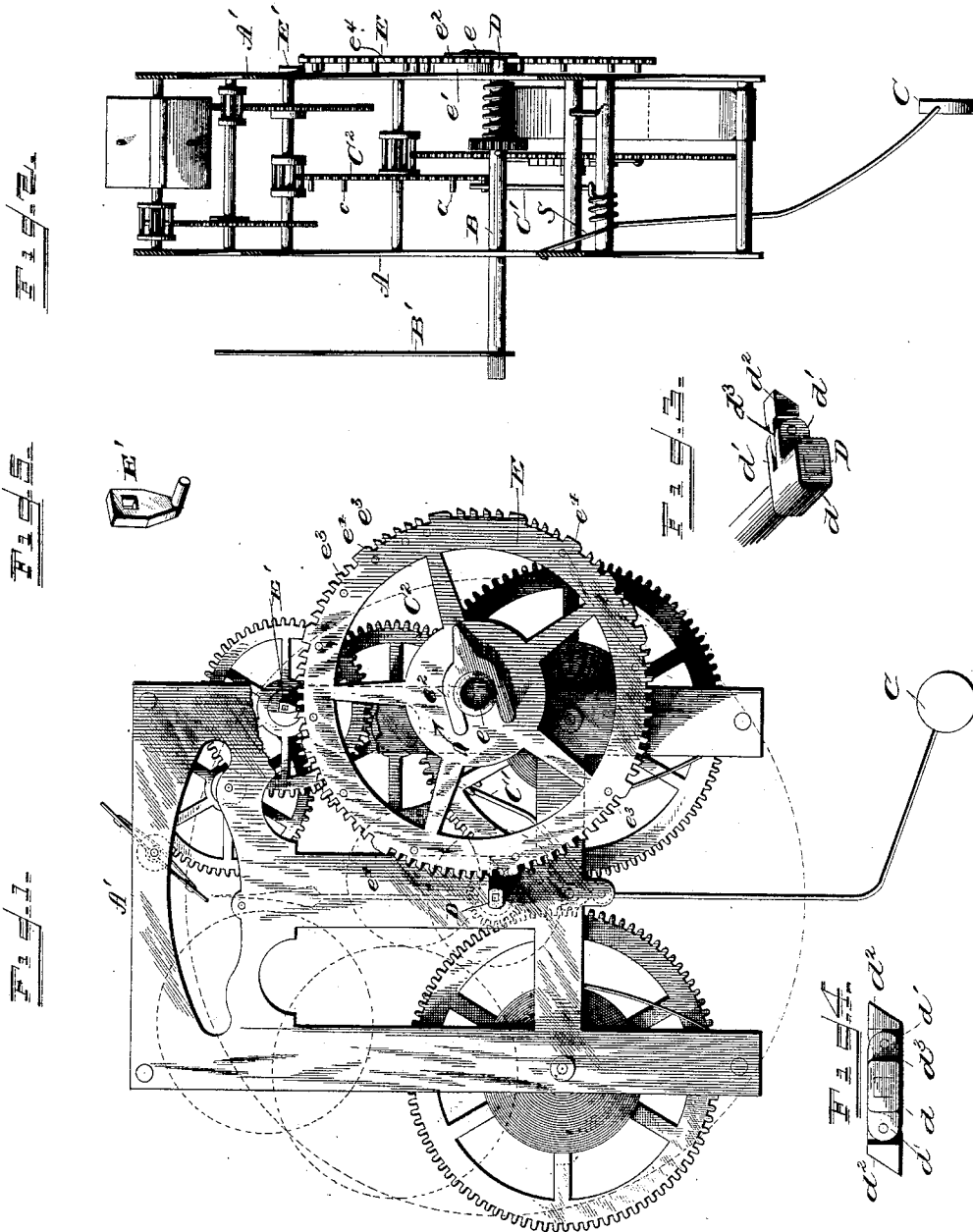
(No Model.)

C. E. BURNHAM.

CLOCK STRIKING MECHANISM.

No. 384,191.

Patented June 5, 1888.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

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## CLOCK STRIKING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 384,191, dated June 5, 1888.

Application filed October 27, 1887. Serial No. 253,548. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. BURNHAM, a citizen of the United States of America, residing at White Plains, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Striking Mechanisms for Clocks; 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to certain new and useful improvements in striking mechanisms for clocks; and it consists in the novel construction, arrangement, and combination of devices, which will be more fully hereinafter described, and pointed out in the claims.

Heretofore the striking mechanism of clocks has been complicated, and, if not complicated, of frail structure, and therefore easily disarranged and not positive in action. These defects have caused inconveniences and an expense of labor and time to mechanics, both at the time of the first construction of the clock and the required adjustment and rearrangement afterward, which has often been found necessary and requisite to regulate the parts and produce a synchronous registration of the striking with the time mechanism.

The essential feature of my invention consists in the use of a positively-acting counting-wheel constructed with peripheral subdivisions in the form of teeth, a portion of which are beveled and are indicative in number of the hours, and intersected by square teeth, which form stops between the hours. The said wheel is further provided with a series of hour-pins on one face thereof, said teeth and pins being engaged, respectively, by a stop-pawl in connection with the registering-wheel and a single movable toothed pinion on an extension of the central arbor.

The primary object of my invention is to provide a striking mechanism for clocks which dispenses with the use of wire-work, cam-wheels, warning-pins, and other small parts, which is positive in its action and regulable

both as to half and full hours, and the application of which requires but slight and immaterial changes in the striking mechanism of ordinary clocks.

The secondary object of my invention is to provide a striking mechanism for clocks which is simple and effective in its operation, strong and durable in its construction, easily understood and readily applied, and which materially decreases the constructive expense, time, and labor.

I attain these objects by my preferred form of construction, as illustrated in the accompanying drawings, wherein like letters of reference indicate similar parts in the several views, and in which—

Figure 1 is a rear elevation of a clock mechanism, showing a portion thereof in dotted lines and with my improved construction in connection therewith. Fig. 2 is a side elevation of a clock mechanism embodying my improvement. Fig. 3 is a detail perspective view of my improved form of single-toothed pinion, used for hours only. Fig. 4 is a detail side elevation of a double-toothed pinion adapted for use in striking both half and full hours. Fig. 5 is a detail perspective view of the upper or stop pawl.

A and A' indicate the front and rear plates of the supporting-frame of the clock mechanism. The ordinary and well-known form of time mechanism is used in this instance, and the striker C is actuated by a spring, S, surrounding a lower arbor, and having a vibrating arm, C', which is in engagement with the pins *c* on the face of a registering-wheel, C<sup>2</sup>, all of which construction is well known and further description thereof unnecessary. The rear end of the central arbor, B, is projected from the back plate, A', and is formed with either a square or screw-threaded bearing, as may be found desirable and best adapted for the intended purpose, the hands B' being mounted on the front projecting end of the said arbor, as is the usual form of construction.

Upon the rear projecting end of the central arbor, B, a single-toothed pinion, D, is mounted, and consists, essentially, of a block, *d*, having ears *d'* projecting from one side thereof, which have a dog, *d''*, pivoted therein

and mounted between the same. The dog  $d^x$  has an inwardly lower projecting portion,  $d^b$ , which is adapted to bear against the lower edge of the block  $d$  between the ears  $d'$ , and thereby prevent a downward pressure thereof. The outer portion of said dog is formed with a head, which engages with mechanism which will be more fully hereinafter described.

The pinion, as just described, is adapted for striking hours only; but, as shown in Fig. 4, a double-toothed pinion is illustrated, which is of similar construction as the single-toothed pinion, with the exception that the dogs are arranged in reverse positions and are adapted for striking the whole and half hours.

To one side of the rear plate,  $A'$ , a count-wheel,  $E$ , is mounted and secured by means of a hollow flanged stud,  $e$ , which is attached to or formed with a bearing-plate,  $e'$ , secured to the said rear plate,  $A'$ . A spring bifurcated washer,  $e^2$ , is secured to the wheel  $E$  and engages with the flanged head of the stud  $e$ , and thereby holds the count-wheel in a relative position with the said stud. The periphery of the wheel  $E$  is divided into seventy-eight teeth. A portion of the beveled teeth  $e^3$  are at an angle to the plane of rotation of the wheel  $E$ , and are indicative of the number of the hours from one to twelve, as indicated on the clock-face. Between each series of beveled teeth  $e^3$  square slightly-broadened stop-teeth  $e^4$  are formed, which cause a cessation of the vibrations of the striker.

The one face of the wheel  $E$  is provided with studs or pins, which are arranged at such distances apart as to be relative to the number of teeth  $e^3$  and to the hours. Immediately above the count-wheel a stop-pawl,  $E'$ , is mounted on the projecting end of an arbor, in connection with and actuated by a train of gearing from the registering-wheel. This pawl  $E'$  engages with the teeth  $e^3$  as it revolves, and when the number of teeth shall have been traversed the projecting pin portion of the said pawl rests on the top surface of the following stop-tooth  $e^4$  and prevents the count-wheel from further revolving.

As the lower central arbor,  $B$ , revolves, the toothed pinion on the rear projecting portion thereof also revolves. As the said arbor carries the minute-hand, it revolves once in an hour, and consequently the single-toothed pinion has the same revolution in the same length of time. The upper pawl,  $E'$ , normally rests on the square-crowned teeth of the count-wheel, and when the pinion has reached the limit of the revolution the head thereof strikes against one of the pins on the one face of the count-wheel and slightly moves the wheel in the direction of the arrow. This movement displaces the pawl  $E'$  from its position of rest on one of the square teeth, and, actuated by the spring mechanism of the striking parts, it revolves and engages with the teeth  $e^3$  until it again reaches a square tooth. This operation

will be continuous in striking the whole hours. When the double pawl is used, the whole and half hours are struck. In this instance the count-wheel will be formed with an increased number of teeth and studs, and is not shown, for the reason that it will be readily understood in the art, and the construction would only be an enlargement of the wheel shown herein.

The remaining portion of the clock mechanism is of ordinary and well-known construction, and will be readily understood by those skilled in the art.

The utility and adaptability of my improvement being obviously apparent, it is unnecessary to further enlarge upon the same herein.

It is obvious that slight variations in the construction and arrangement of the improved parts might be made and substituted for those shown and described without in the least departing from the nature and principle of my invention.

Having thus described my invention, what I claim as new is—

1. The combination, with the time and striking train mechanism of a clock, of a count-wheel having a series of beveled teeth intersected by flat-faced stop-teeth, the tops of which are partially beveled, and a series of pins or studs, a stop-pawl connected to the striking-train, and a pinion attached to the time-train, said pawl and pinion relatively operating to respectively stop and start the movement of the count-wheel, substantially as described.

2. The combination, with the time and striking train mechanism of a clock, of a count-wheel constructed as set forth, a pinion to start the movement thereof, and a pawl to limit and stop its movement, substantially as described.

3. The combination, with the time and striking mechanisms of a clock, of the pinion having one or more movable teeth or dogs, the count-wheel constructed with teeth and pins, as set forth, and the stop-pawl, all arranged and operating as set forth.

4. The combination, with the time and striking mechanisms of a clock, of a pinion having one or more movable teeth or dogs mounted on the rear projecting end of the hand-arbor, the count-wheel having the form of teeth set forth, the bearing-stud for the count-wheel having a flange, the bifurcated spring-washer, and the stop in connection with the striking mechanism, substantially as described.

5. The combination, with the time and striking mechanisms of a clock, of a pinion having one or more movable teeth or dogs mounted on the rear projecting end of the central or hand arbor, the count-wheel having a series of teeth and studs or pins, as set forth, the teeth or dogs of said pinion engaging with the said studs or pins, and a revolving stop-

pawl arranged above the count-wheel in connection with the striking mechanism, and having a projecting pin which engages with the teeth of the said count-wheel, and bearing on a portion thereof to stop the revolution of the count-wheel, substantially as described.

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

CHARLES E. BURNHAM.

Witnesses:

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R. C. O'NEIL.