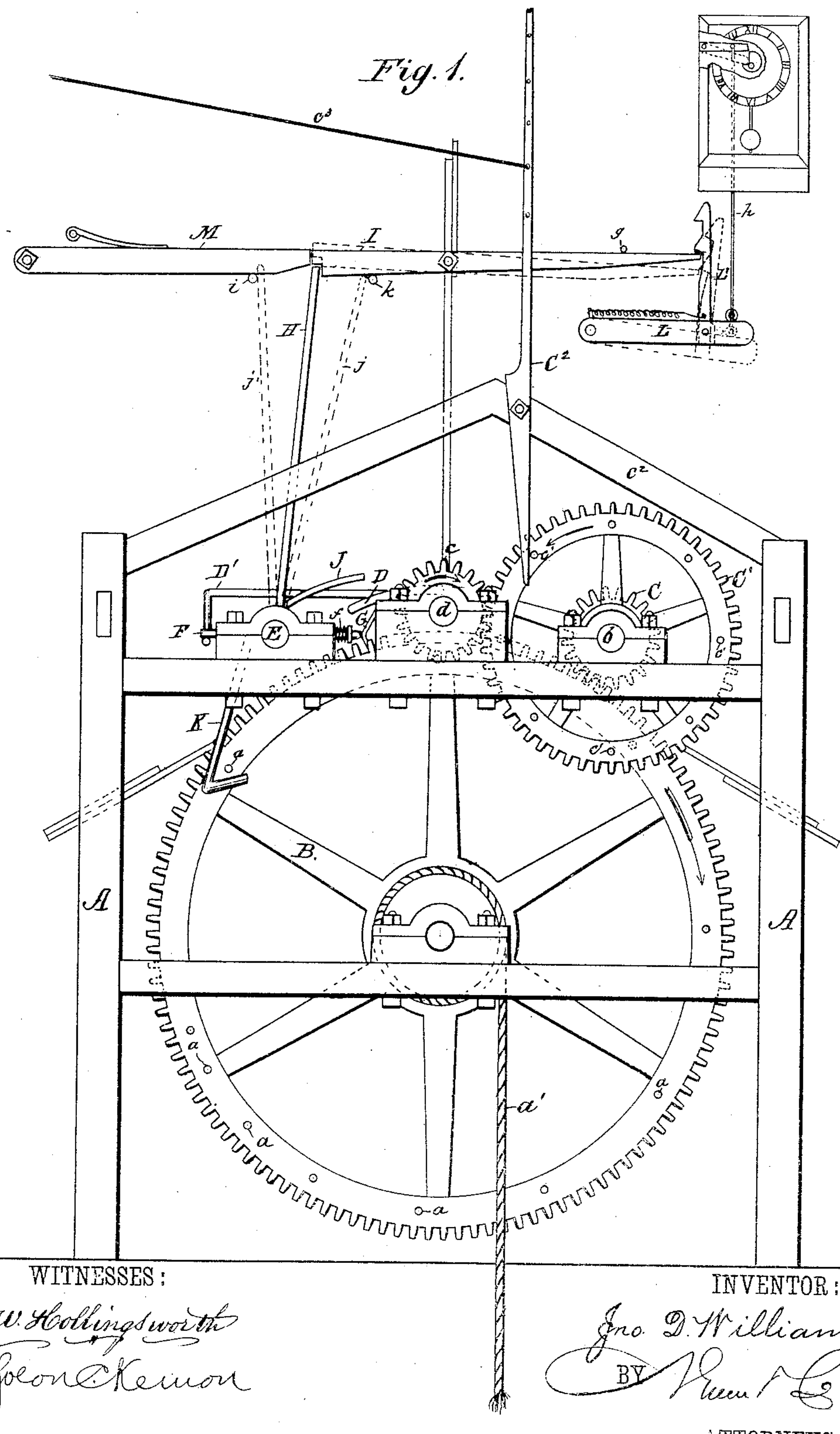
(No Model.) 2 Sheets—Sheet 1.

J. D. WILLIAM.

BELL STRIKING APPARATUS FOR CLOCKS.

No. 264,810. Patented Sept. 19, 1882.

Fig. 1.



WITNESSES:

W. W. Hollingsworth

Solon C. Kemon

INVENTOR:

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

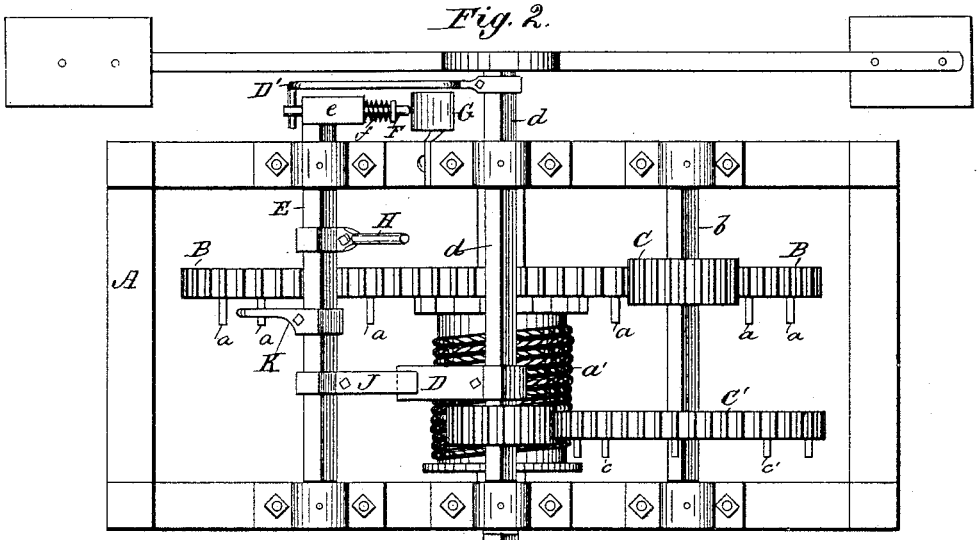
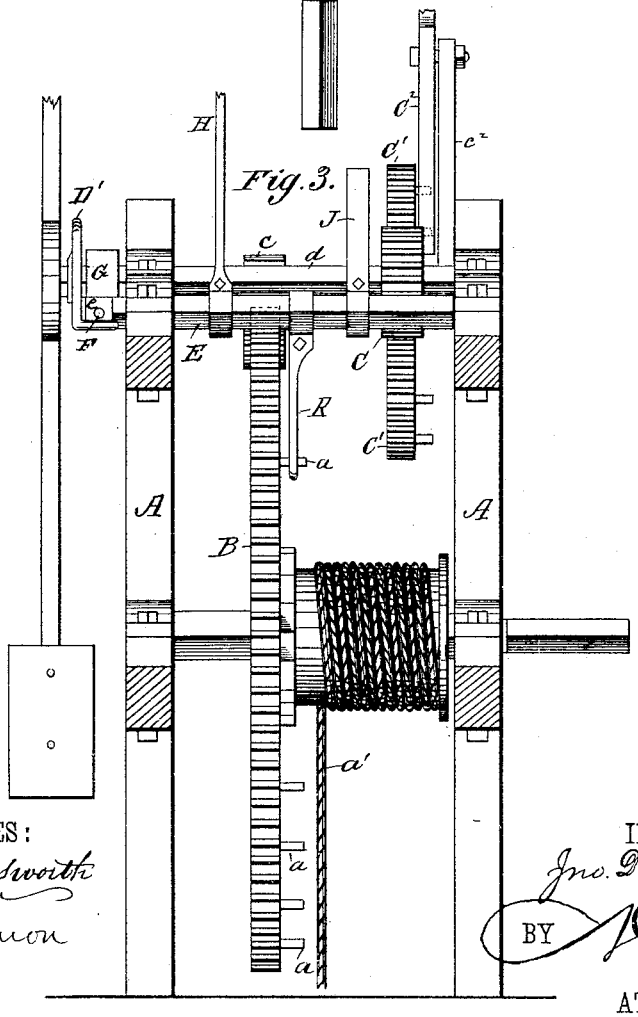


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN D. WILLIAM, OF RISING SUN, INDIANA.

BELL-STRIKING APPARATUS FOR CLOCKS.

SPECIFICATION forming part of Letters Patent No. 264,810, dated September 19, 1882.

Application filed June 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. WILLIAM, of Rising Sun, in the county of Ohio and State of Indiana, have invented a new and Improved Bell-Striking Apparatus for Clocks; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of my improved bell-striking mechanism for clocks. Fig. 2 is a plan view of the same, and Fig. 3 is a vertical section thereof.

This invention relates to improvements in bell-striking mechanism specially adapted for clocks, and has for its object to cause the striking of a bell capable of being heard miles distant by the action of a clock of small size; and the nature of said invention consists of the combination and arrangement of parts, substantially as hereinafter more fully set forth and claimed.

In carrying out my invention I employ a suitable upright frame, A, upon lower cross-pieces of which is hung a large toothed wheel, B. This wheel has twelve laterally-projecting pins, *a*, dividing up its circumference on one side into twelve spaces, answering to the twelve hours of a day of that length, it being capable of making a complete revolution in as many hours, or one-twelfth of a revolution each hour. Around a pulley on the axis of this wheel is coiled or wound a rope, *a'*, at the dependent end of which is attached a weight to cause the partial rotation of said wheel when the bell is to be struck, as hereinafter explained. In lieu of the rope and weight, a spring may be used.

C is a pinion on one end of an axis, *b*, journaled upon upper cross-bars of the frame A, said pinion gearing with the wheel B. Upon the other end of the shaft *b* is secured a larger pinion, C', gearing with a small pinion, *c*, on a shaft, *d*, also journaled upon the upper cross-bars of the frame A. The pinion C' has a series of eight pins, *c'*, projecting from one side of its periphery.

C^2 is a lever pivoted, it may be, to a support, c^2, fastened to the frame A. This lever is connected to the bell-clapper by suitable means—as, for instance, by a cord or wire, c^3, which is capable of attachment to the lever at different points by means of the series of apertures in said lever, as may be desired.

Secured to the shaft *d*, preferably made angular for that purpose, are a curved cam-bar, D, and a crank-bar, D', one arranged near each end.

E is a rock-shaft, journaled also upon the upper cross-bars of frame A a suitable distance from the shaft *d*.

Capable of sliding in a sleeve, *e*, affixed to one end of the shaft E, and at right angles thereto, is a rod or bolt, F, having a spring, *f*, to hold it in a forwardly-projected position.

G is a V-shaped cam-bar, secured in such a position upon one of the bearings or journals of shaft *d*, or at other convenient point, as that the forward end of the bolt F in its normal position will rest upon its upper inclined surface.

H is a bar or rod fixed to the rock-shaft E, and reaching up into the notch or recess of one end of a lever, I, suitably hung in position. This lever is held, as against having upward movement at its rear end, by a stop or stud, *g*, arranged at a point above the forward end of said lever.

J is also a curved cam-bar affixed to the shaft E, and capable of being struck by cam-bar D on the shaft *d* at a certain time, as hereinafter described. Fixed to and depending from the same shaft, E, is a cam-rod, K, arranged so as to be struck at intervals by the pins or studs *a* on the wheel B, as presently seen.

L is a lever of the third class, pivoted adjacently to the lever I, and having a spring toothed bar or pawl, L', adapted to engage with and pull down the forward end of the lever I. The forward end of the lever L is connected to the clock striking mechanism by cord *h* or otherwise.

M is also a spring-pawl, which is arranged in line with and meeting the lever I, and supported by a stud, *i*, near its free end. This stud also serves as a stop to arrest the rearward movement of the rod H on rock-shaft E.

It will be noticed that as the lever L, with its pawl L', is lifted by the clock striking mechanism, which takes place just previous to the striking operation of the clock, the middle tooth of said pawl will move past and stop immediately above the forward end of the lever I. The instant the clock strikes the lever L falls, per-

mitting its pawl to pull down the forward end of the lever I, which readily yields, the weight of the pawl and lever alone being sufficient to effect the result. The beveled face of the engaging tooth of the pawl L′, with its spring, will permit the pawl to readily escape from the lever I, to allow the latter to return to its original position as the lever L, having said pawl, descends to its lowest point. This operation—*i. e.*, the falling of the lever L—will elevate the rear end of the lever I and allow the rod H to escape from its notch and fall or move forward by gravity, it being disposed in a sufficiently forwardly-inclined position for that purpose, to the dotted-line position *j*, where it is arrested by the stop *k*. This action of the rod H partially rotates the shaft E, which carries the spring bolt or rod F downward, causing it to descend the cam G and pass its base. This movement of the spring-rod F will permit the disengagement therefrom of the crank-rod D′, when the shaft *d* will be permitted to revolve. The weighted rope *a′* will now cause the wheel B to turn and engage or operate the pinion C, which will turn the shaft *b*, transmitting motion to the wheel C′, causing its studs to give the required number of vibrations to the bell-clapper-operating lever C^2. The wheel C′ will operate the pinion *c* on the shaft *d*, carrying the released crank-rod D′ and the cam D. The upwardly-moving cam D will strike the previously lowered cam J of the shaft E, and thus effect the reversing the movement of the shaft E. This reverse movement of the shaft E will continue until the rod H has reached the dotted-line position *j′*, where said rod is arrested by the stop *i*. In the meantime the cam-rod K will be lowered in a plane to intercept the approaching pin or projection of the series of pins *a* on the wheel B, to arrest further movement of the latter at the desired interval, or when the requisite number of strikes have been given the bell to indicate the hour being struck. When the shaft E has completed its reverse movement the spring-rod F will ascend or regain its former position upon the cam G, and thus again impart a forward movement to the shaft E, which will bring the rod H back to its first position, when it will again enter the notch of lever I and be held until another hour is to be struck. Simultaneously with the latter movement of the rod H the rod F, by the action of the cam G, will be moved rearward and intercept and hold the crank-rod D′ against further movement by the action of the aforesaid mechanism acted upon by the weighted rope. This mechanism is capable of striking a bell which may be heard miles distant by a clock of small size.

Having thus fully described my invention, I claim and desire to secure by Letters Patent—

1. In a bell-striking mechanism, the combination of the lever L, having the spring-pawl L′, and capable of operation by the action of the clock striking mechanism, the notched lever I, stop *k*, shaft E, having rod H, cam J, and sliding spring rod or bolt F, shaft *d*, having crank-rod D′ and cams D and G, and gearing mechanism under the action of a weighted rope or spring, and adapted to operate the bell-clapper-operating lever, substantially as and for the purpose set forth.

2. In a bell-striking mechanism, the combination of the lever L, having the spring-pawl L′, and capable of operation by the clock striking mechanism, the notched lever I, spring-pawl M, stops *i* and *k*, shaft E, having the sliding spring F, rod H, and cams J K, shaft *d*, having the crank-rod D′ and cam D, V-shaped cam G, the bell-clapper-operating lever C^2, and operating mechanism having wheels B and C, provided with lateral projections or pins *a c′*, substantially as and for the purpose set forth.

JOHN D. WILLIAM.

Witnesses:
GEO. E. DOWNEY,
JOHN B. COLES.