

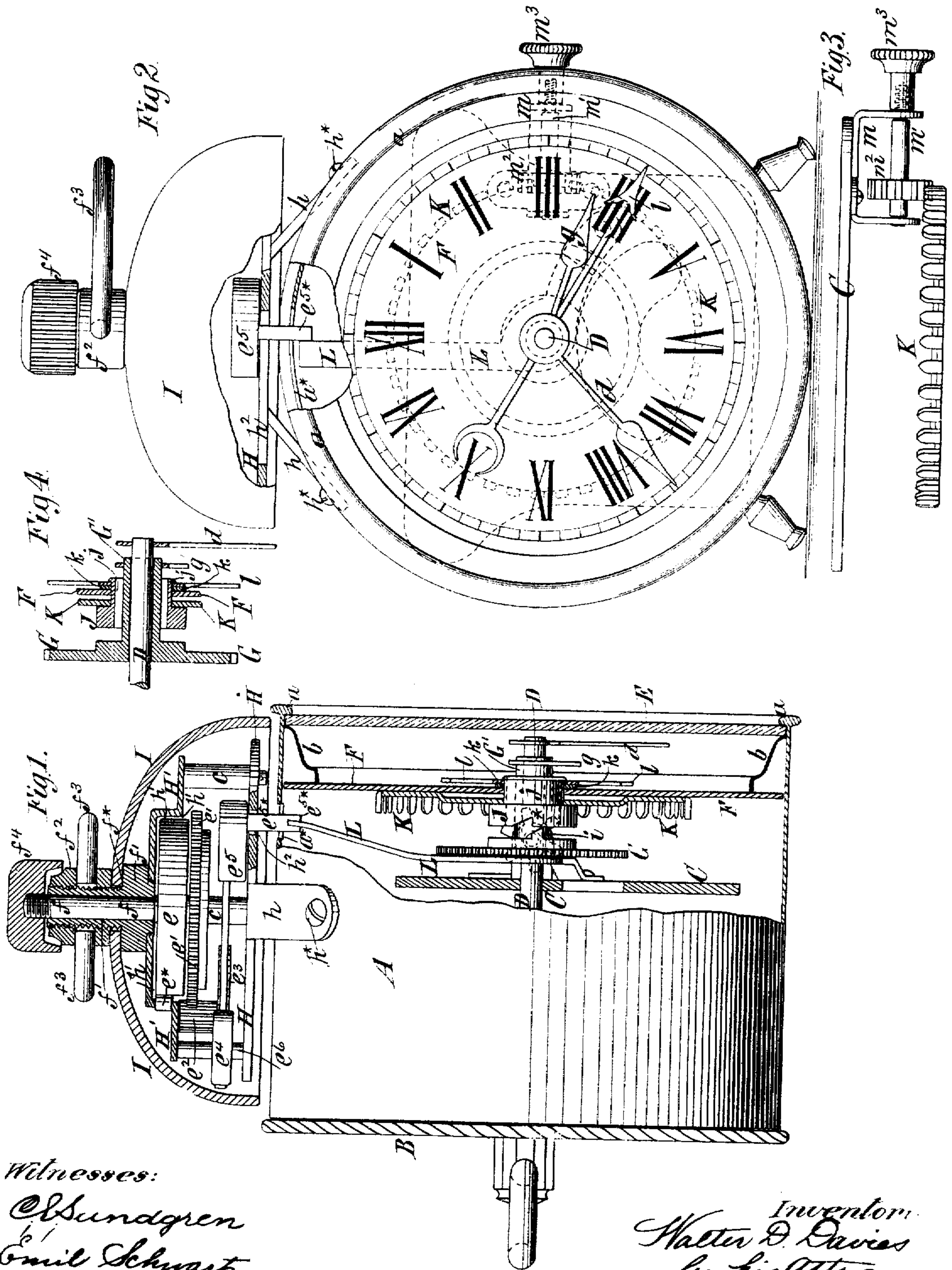
(No Model.)

W. D. DAVIES.

ALARM CLOCK.

No. 315,603.

Patented Apr. 14, 1885.



Witnesses:

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UNITED STATES PATENT OFFICE.

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ALARM-CLOCK.

SPECIFICATION forming part of Letters Patent No. 315,603, dated April 14, 1885.

Application filed November 2, 1884. (No model.)

To all whom it may concern:

Be it known that I, WALTER D. DAVIES, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Alarm-Clocks, of which the following is a specification.

My invention relates, principally, to alarm-clocks which have the alarm-bell and alarm-movement arranged upon the exterior of the case, as is shown and described in my application for Letters Patent, Serial No. 120,002, filed February 7, 1884, the alarm-movement being arranged within the bell and the alarm-hammer being arranged to operate in a horizontal plane upon the inner side of the bell. In clocks of this class the tripping mechanism for releasing the alarm-hammer at a desired predetermined time is arranged within the case, and in the clock which forms the subject of my above-mentioned application the trip-lever was extended through the top of the case and engaged the hammer.

The cases of clocks of this kind are commonly cylindric or polygonal in shape, and the entire movement is inserted at the back of the case as one piece. In my aforesaid application the trip-lever, as it had to be long enough to project from the case, interfered somewhat with the direct insertion of the movement into the case; and one object of my invention is to avoid this difficulty, and to so construct and combine the trip-lever and alarm-hammer that the trip-lever will not project through and beyond the case, and will not, therefore, interfere with the direct insertion of the movement into the case. To this end I provide the hammer with a downward projection which extends through a slot in the case into engagement with the trip-lever, so as to be blocked or held against movement by said lever until the trip releases it.

Another object of the invention is to reduce the size of the alarm-bell without at the same time reducing the size of the alarm-movement or its spring. To this end I construct the top or upper plate of the alarm-movement with an upwardly-extending and central hub or projection, forming within it and on the un-

der side of said plate a circular cavity wherein the alarm-spring is contained.

The plates which form part of the frame for the alarm-movement are necessarily of greater diameter than the spring, and the arrangement of the spring in a cavity, as described, enables the spring to occupy a position higher up in the bell than would be possible if the upper plate were flat with the spring below it, and to that extent reduces the size of the bell necessary to contain the alarm-movement.

Another feature of the invention, which is not restricted to alarm-clocks having the bell and alarm movement external to the case, relates to clocks wherein the alarm-index is concentric with the main arbor, and which are termed "central-setting" alarms.

In such clocks as heretofore constructed the glass at the front of the dial (if a glass is used) is set in a sash, which must be opened when it is desired to set the alarm. This movable sash adds to the cost of the clock; and another object of the invention is to enable a fixed glass to be used and still have the central alarm-setting.

To this end the invention also consists in a novel combination of parts, hereinafter described, whereby the central setting of the alarm may be accomplished by a spindle extending through the side of the case.

The invention also consists in other combinations of parts, hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents a partly sectional side elevation of a clock embodying my invention. Fig. 2 is a front elevation thereof with a portion of the alarm-bell and the adjacent portion of the case broken away or removed. Fig. 3 is a plan view representing the front plate of the frame of the movement and the gearing whereby the central setting of the alarm is accomplished; and Fig. 4 is a sectional view in a plane parallel with the main arbor, illustrating a part of the alarm-setting devices and a portion of the dial with their adjacent parts.

In all of the figures similar letters of reference designate corresponding parts.

A designates the case, which is shown as circular, and B designates the back of the case, which is removable therefrom with the movement.

5 The time-movement forms no part of my invention, and I have, therefore, only shown such parts thereof as are necessary to a clear understanding of my invention. All other parts may be of any well-known or suitable construction.

C designates the front plate of the movement, and D designates the main arbor, to which is attached the minute-hand *d*.

E designates a fixed glass, which bears against an inwardly-projecting flange, *a*, at the front of the case A, and behind which is a bezel or ring, *b*, against which bears the dial F, whereby all said parts are held in place.

G designates the hour-wheel, having the usual sleeve or pipe, *G'*, projecting from it, and carrying at its outer end the hour-hand *g*.

H H' designate, respectively, the lower and upper plates, which, with their connecting-posts *c*, constitute the frame of the alarm-movement. The lower plate, H, is constructed with arms *h*, which are cut or stamped from it and deflected or bent downward, as shown in Fig. 2, so as to straddle and rest upon the top of the case. These arms *h* are secured by screws *h*^{*} or other means to the case. The upper plate, H', of the movement has an upward central hub or projection, forming on the under side thereof a circular cavity, *h'*, in which is arranged the alarm-spring *e*. This spring has one end, *e*^{*}, fast in the plate H', and by its other end acts upon the main or winding-arbor *f* of the alarm. The main wheel *e'* of the alarm-movement drives into a pinion, *e*², and on the same arbor with the pinion is an escape-wheel, *e*³, which operates the escape-pallet *e*⁴ on the hammer *e*⁵, the hammer being pivoted at *e*⁶.

In or to the top plate, H', is rigidly secured a post or stem, *f'*, which is shouldered at *f*^{*}, and on which is supported the alarm-bell I. The bell is held in place by the nut *f*², in which the suspension-ring *f*³ is secured, and which is screwed upon the stem *f*'. The winding-arbor *f* extends through the post or stem *f'*, which is hollow, and has at the top a button or head, *f*⁴, whereby it may be turned. The extent of the upper plate, H', is necessarily greater than the size of the spring, and it is obvious that by arranging the spring in a cavity, *h'*, formed by an upward projection on the plate, I arrange the spring higher up in the bell I than would be possible if the spring were on the under side of a flat plate. Consequently, the distance between the plates H H' at the posts *c* is less than it otherwise would be, and the size or height of the bell necessary to contain within it and conceal the whole alarm-movement is reduced.

It will be observed that the hammer *e*⁵ is arranged to work in a horizontal plane, and has a downward projection or arm, *e*^{5*}, which

extends through and plays in slots *h*² *a*^{*} in the lower frame-plate, H, and case A, for a purpose hereinafter described.

I will now describe the alarm tripping and setting mechanism. On the outer face of the hour-wheel G is a hub having a tooth or projection, *i*, which constitutes the tripping-cam; and J designates the alarm-cam, which is notched at ^{*} to receive the tooth or projection *i* when the latter is brought opposite the notch by the rotation of the hour-wheel G.

The alarm-cam J is constructed with a sleeve or pipe, *j*, which extends through a central opening in the dial-plate F, as best shown in Fig. 4.

On the sleeve or pipe *j*, inside of and against the dial, is secured firmly a contrate or crown wheel, K, and on the said sleeve or pipe outside the dial is a washer, *k*, and the alarm index or hand *l*, the end of the pipe or sleeve *j* being riveted or turned outward to hold all in place.

As shown best in Fig. 1, the central portion of the wheel K is concaved or set back in a direction away from the dial, and its elasticity serves to hold the alarm-cam against accidental turning, the outer portion of the wheel having frictional contact with the inner face of the dial-plate F.

On the front of the plate C of the movement is secured a bracket, *m*, as shown in Fig. 3, in which is journaled a setting spindle or arbor, *m'*, on which is a pinion, *m*², gearing into the contrate-wheel K. The spindle or arbor *m'* projects through the side of the case, as shown in Fig. 2, and is provided outside the case with a head thumb-piece, *m*³, whereby it may be turned to turn the alarm-cam J and index or hand *l*, to release the alarm mechanism at any predetermined hour.

Behind the hour-wheel G is the trip-lever L, which is secured to the plate C, and which has elasticity to cause it to spring outward from said plate. The trip-lever when the alarm is set is obtruded in the way of the projection *e*^{5*} on the hammer *e*⁵, as shown in Fig. 1, and so holds the hammer against operation. The trip-lever is held in this position by the cam-projection *i*, bearing on the face of the alarm-cam J; but when the tooth or projection *i* reaches the notch ^{*} the trip-lever L is allowed to spring forward, carrying its upper end out of the way of the projection *e*^{5*} on the hammer and allowing the alarm to operate.

It will be observed that the end of the trip-lever L does not extend quite to the cylindric case A, and hence it does not in any way interfere with slipping the movement into place from the back of the case.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a clock-case and an alarm-bell upon the exterior thereof, of an alarm-movement arranged within the bell and comprising a hammer arranged to operate in a horizontal plane, and having an arm or pro-

jection extending downward through a slot in the case into the interior thereof, and a trip-lever serving to block the alarm-hammer by engaging with the downward projection there-
5 on, substantially as herein described.

2. The combination, with a clock-case and an alarm-bell on the exterior thereof, of an alarm-movement and a frame therefor, all arranged within the bell, one plate of the alarm-
10 movement having a cavity formed in a hub or projection from its upper side and containing therein the spring of the alarm-movement, substantially as herein described.

3. The combination, with the dial-plate F, having a central aperture, of the alarm-cam J, having a sleeve, *j*, extending through the dial-plate, the alarm-index on said sleeve, out-

side the dial-plate, the contrate-wheel K, fast on said sleeve inside the dial-plate, and the arbor and pinion *m' m''* for turning said contrate-
20 wheel and alarm-cam, substantially as herein described.

4. The combination, with the clock-case A and the bell I, of an alarm-movement contained within the bell, and comprising the
25 plate II, having arms *h*, which extend downward and outward in opposite directions and are attached to the case, substantially as herein described.

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Witnesses:

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