

No. 772,165.

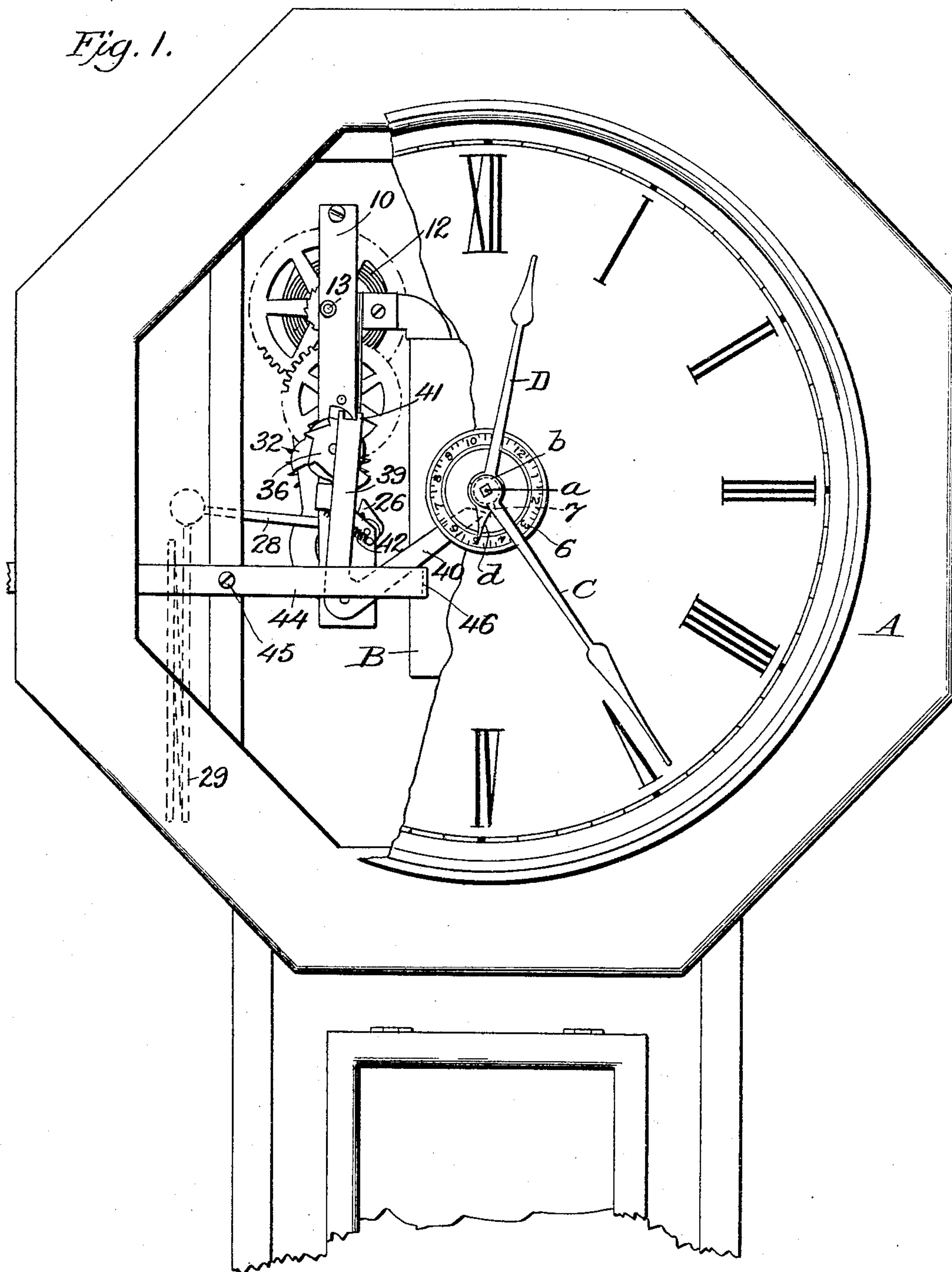
PATENTED OCT. 11, 1904.

J. MATZINGER.  
EIGHT DAY ALARM CLOCK.  
APPLICATION FILED FEB. 12, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

*Fig. 1.*



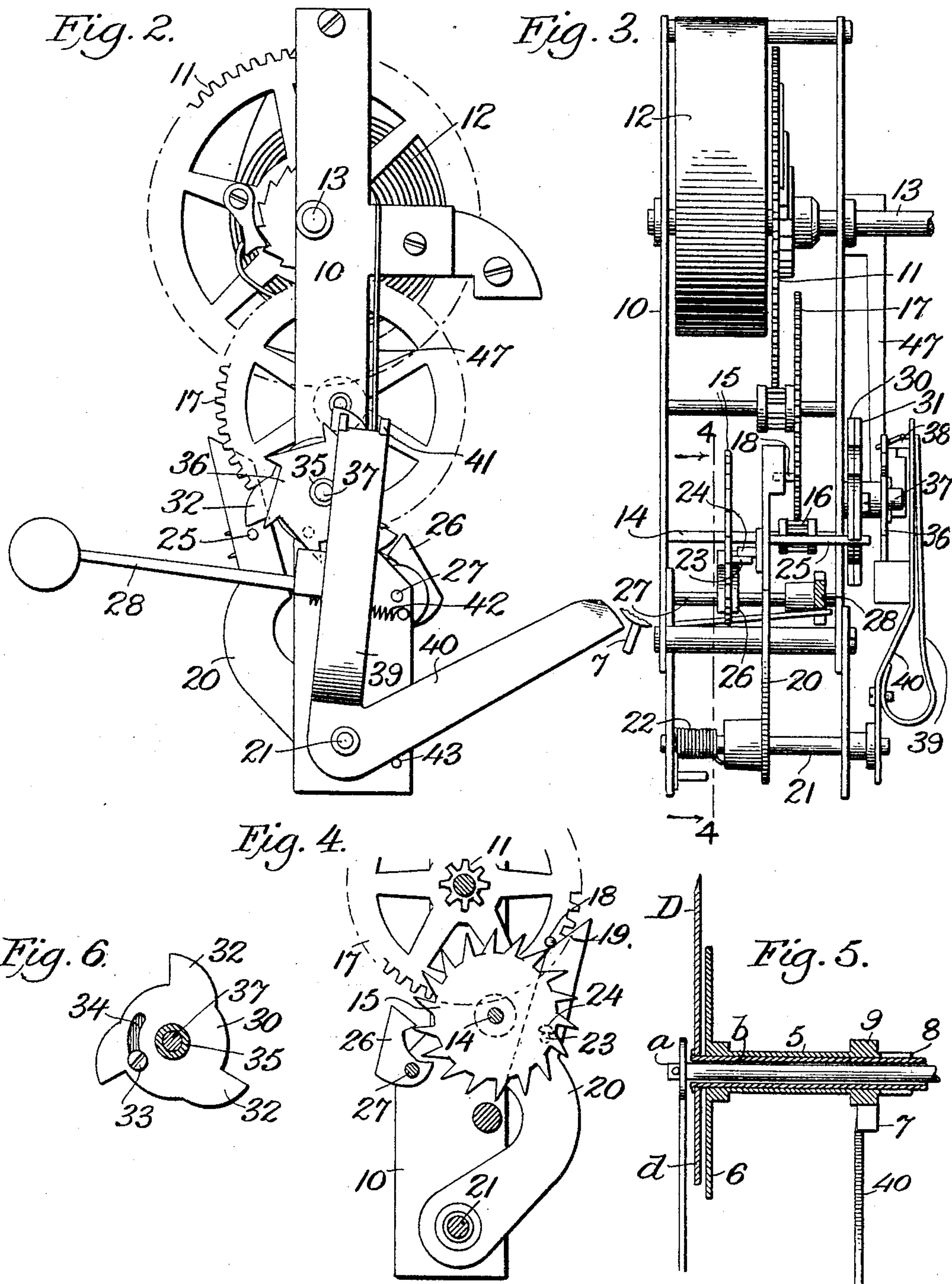
Witnesses  
James F. Duhamel,  
V. E. Nichols.

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By his Attorneys  
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# UNITED STATES PATENT OFFICE.

JOHN MATZINGER, OF NEW YORK, N. Y.

## EIGHT-DAY ALARM-CLOCK.

SPECIFICATION forming part of Letters Patent No. 772,165, dated October 11, 1904.

Application filed February 12, 1904. Serial No. 193,250. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN MATZINGER, a citizen of the United States, residing in the city of New York, borough of Manhattan, in the  
5 county and State of New York, have invented certain new and useful Improvements in Eight-Day Alarm-Clocks, of which the following is a specification.

My invention relates to improvements in  
10 alarm-clocks of that class wherein the spring of the alarm-striking mechanism may be wound once in eight days or with more or less frequency, as desired, for the purpose of actuating the hammer of an alarm bell or  
15 gong at the required period once in every twelve or twenty-four hours of each of a number of days, thus dispensing with the labor of winding the alarm mechanism every day and enabling said alarm mechanism to be used to  
20 good advantage in connection with that style of clocks which are wound once in eight days, whereby the clock-train and the alarm mechanism may each be wound at the required intervals of eight days.

25 In my invention provision is made for automatically releasing the striker of the alarm-train at the proper hour or fraction thereof at which it is desired to set off the alarm, but an element of the controlling or setting de-  
30 vices of the alarm mechanism is exposed for ready access in order that it may be adjusted easily by hand for the purpose of releasing the alarm-train at any predetermined hour or fraction thereof.

35 The invention also includes means by which the alarm mechanism may be set or adjusted to release the striker once in every twelve hours instead of once in every twenty-four hours, although for ordinary purposes it is  
40 sufficient to use the alarm mechanism once in the stated interval of twenty-four hours.

I also contemplate the employment of a throw-off lever by which a member of the alarm mechanism may be adjusted out of the  
45 path of a rotating finger on the revoluble sleeve of a setting-dial, thus throwing the alarm mechanism out of service while retaining the spring of such mechanism in a wound-up condition ready for service again by the

simple adjustment of said throw-off lever back 50 to its operative position.

Further objects and advantages of the invention will appear in the course of the subjoined description, and the actual scope of the invention will be defined by the annexed 55 claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which like characters of reference are used to indicate corresponding parts in all the 60 figures.

Figure 1 is a front elevation of a portion of a clock, partially broken away and showing my improved alarm mechanism. Fig. 2 is a front elevation of the alarm mechanism, on 65 an enlarged scale, removed from the clock-casing. Fig. 3 is a side elevation of the alarm mechanism shown by Fig. 2. Fig. 4 is a detail sectional elevation, the plane of the section being indicated by the dotted line 4 4 of 70 Fig. 3. Fig. 5 is a cross-section through the arbors for the hour and minute hands of the clock, showing the alarm-dial and its sleeve for controlling the releasing devices of the alarm-train. Fig. 6 is a detail view of a 75 divided adjustable cam by which the frequency of operation of the alarm-train may be increased or diminished, the dotted lines illustrating an adjusted position of one member of said cam. 80

To enable others to understand my invention, I have shown it applied to an ordinary form of eight-day clock by Fig. 1 of the drawings. Within the casing A is installed an ordinary time-train B for driving the arbor a 85 of the minute-hand C and the tubular arbor b of the hour-hand D. The clock may be of the usual or any preferred construction; but as my invention may be used in connection with any style of clock I do not consider it 90 necessary to enter into a detailed description of the construction and mode of operation of the clock mechanism.

An important feature of my alarm mechanism is a revoluble sleeve 5 in one with an 95 alarm-dial 6 and provided with an actuating-finger 7. The sleeve and the alarm-dial are made rigid one with the other, and they may



be made integral, the inner end of said sleeve being split or divided at 8 to give a certain amount of elasticity thereto. The finger 7 may be provided on the sleeve in any suitable way, but, as shown by Fig. 5, the finger is attached to a collar 9, integral with the sleeve at one side of the split portion thereof. Said sleeve is slipped over the tubular arbor *b* of the hour-hand to have tight frictional engagement with the arbor for rotation therewith; but the alarm-dial and the sleeve may be adjusted by hand in order to vary the position of the actuating-finger with respect to the releasing device of the alarm-train. The sleeve 5 passes through the clock-dial, and the alarm-dial is arranged compactly between the clock-dial and the hands in order to expose it to convenient access for manipulation by the operator, for which purpose the alarm-dial has a milled edge. As shown by Fig. 1, the hour-hand D has a pointer *d*, which extends across the alarm-dial, the exposed face of which is inscribed with numbers and designations to indicate the hours and the fractions thereof.

As shown by Fig. 1, an alarm-train is disposed within the clock-casing, the frame 10 of said train being fastened to said casing. The alarm-train 11 may be of any suitable type adapted to be propelled by a motor-spring 12 on a winding-arbor 13, that passes through the clock-dial. A pinion-shaft 14 of the alarm-train carries an anchor-wheel or pallet-wheel 15, and a pinion 16 on the pinion-shaft 14 is driven by a gear 17 of the train, said gear being provided with a laterally-extending stud or pin 18. In the path of rotation of this pin or stud is the beveled face 19 of a locking-lever 20, the latter being disposed in an upright position on one side of the alarm-train and being made fast with a rock-shaft 21, that is mounted in the lower part of the frame 10. This lever is normally impelled toward the path of the rotating stud 18 by a spring 22, coiled around the shaft 21, said spring being anchored at one end on the frame 10 and acting at its other end against the shaft 21 or the lever 20. The pallet-wheel 15 is provided with a stud 23, which rotates therewith and projects toward the lever 20, and said lever is equipped with two pins or studs 24 25, the same being of unequal lengths and projecting in opposite directions from the respective sides of the lever. The short stud 24 extends toward the pallet-wheel 15, and normally it lies in the path of the rotating stud 23 on said wheel, so that the two studs 23 24 have co-operative engagement when the parts are at rest in order that the stud and the lever may lock the alarm-train from movement under the energy of the motor-spring 12.

The pallet-wheel 15 is engaged by an anchor or pallet 26, fast with a striker-shaft 27, mounted in the frame 10, and secured firmly to this striker-shaft is a hammer-arm 28, the latter being actuated by the shaft and the anchor

when the teeth of the revoluble pallet-wheel 15 impart vibratory movement to the anchor on the release of the alarm-train from the restraint of the stud 24, that is carried by the locking-lever 20. This hammer-arm strikes a bell or gong, (indicated by dotted lines at 29 in Fig. 1,) said gong being located, preferably, outside of the clock-casing, and to enable the hammer to strike the gong it passes through the clock-casing, although it should be understood that the particular location of the gong and the arrangement of the hammer is not material.

The long stud or arm 25 of the locking-lever projects into the path of a controlling-cam, (shown by Figs. 2, 3, and 6 of the drawings,) said cam consisting of complementary members 30 31, clamped adjustably one to the other and each provided with a plurality of projections 32, herein shown as three in number, although this may be varied. The clamping means are embodied in the form of a screw 33, which passes through a slot 34 in one member and is threaded into the other member, although the particular clamping device is not essential. In Figs. 3 and 6 the members of the cam are shown as being adjusted to corresponding positions, wherein the three projections 32 of one member register with the similar projections of the other member for making the two members serve as one in releasing the alarm-train once in twenty-four hours for three successive days; but in case it is desired to release the alarm-train twice in twenty-four hours the clamping-screw may be slackened, one member of the cam turned to a position wherein the projections thereof alternate with those of the other member, and the clamp retightened to make the members turn as one part, thus affording means by which the stud or arm and the lever 20 may be operated at intervals of twelve hours. The cam has a sleeve 35 made fast with one of its members, on which sleeve is adapted to be adjusted the other cam member, and said sleeve carries a ratchet 36, the latter being one element or member of a step-by-step feed device that is actuated by the rotating finger 7 of the alarm-dial sleeve 5. The cam and its sleeve 35 are mounted idly on a short post 37, projecting from the frame 10. With the ratchet 36 coöperates a beveled lip 38 of a spring-pawl 39, said lip and pawl being shown more clearly by Fig. 3 and said pawl being compactly arranged against one arm of an angular feed-lever 40. Said spring-pawl is fastened to the lever, and the lip of the pawl plays in a slotted or forked end 41 of the lever, said forked end of the lever being clearly shown by Fig. 2, thus bringing an arm of the lever and the pawl into overlapping relation to the ratchet, as in Fig. 2, so as to make the lip 38 assume a position wherein it will engage with the teeth of the ratchet successively on the repeated move-



ments of the lever. Said lever is fulcrumed at its knee by mounting it loosely on an end portion of the rock-shaft 21, and it is normally drawn in one direction by a spring 42, shown  
 5 as a coiled spring anchored on the frame 10, the movement of the lever under the energy of the spring being arrested by a stop 43 on said frame. One arm of the angular feed-lever is arranged in the path of the finger 7, which  
 10 rotates with the tubular arbor of the hour-hand, and at the proper time this finger engages with said arm of the feed-lever in a way to move it against the tension of the spring 42. This movement of the lever turns it to  
 15 make the spring-pawl travel with the other arm, so that the lip 38 will ride over one tooth of the ratchet and snap into engagement therewith. The spring 42 pulls said lever and the  
 20 pawl back to the position where the stop 43 arrests the travel of the lever, thus making the pawl turn the ratchet one tooth. Assuming that the cam is adjusted to operate the locking-lever once in twenty-four hours, the feed-pawl turns the ratchet and the cam at  
 25 the end of twelve hours to a position where on the first operation the long stud or arm 25 will lie between two of the projections 32 of said cam, thus allowing the alarm-train to remain at rest; but on the next rotation of the  
 30 hour-hand, the sleeve 5, and the finger 7 the latter again moves the feed-lever for the pawl to again turn the ratchet and the cam, thus bringing one projection 32 of said cam against the lever 20, whereby the latter is  
 35 pressed back against the tension of the spring 22 a sufficient distance to make the stud 24 clear the stud 23 of the pallet-wheel. This releases the alarm-train for the spring 12 to drive the gear 17 and cause the pallet-wheel  
 40 to actuate the hammer through the medium of the anchor and the striker-shaft, thereby sounding the alarm. Ordinarily the rotation of the gear 17 when it makes one complete turn will cause the stud 18 of said gear to  
 45 press the lever back to normal position and interpose the stud 24 in the path of the stud 23 and stop the operation of the alarm-train and the alarm; but to increase the length of operation of the alarm I make the number  
 50 of teeth in the gear 17 in unequal proportion to the teeth of the pinion 16 and the rest of the gears of the train, whereby on the operation of the alarm the stud 18 will ride at the end of the first revolution of the gear 17  
 55 against the end 19 of the lever 20 at a time when the stud 23 of the pallet-wheel is at quite a distance from the stud 24 of the lever, thus allowing the stud 18 to move and ride past the lever 20 before the stud 23 of the  
 60 pallet reaches the path of the stud 24. This permits the alarm to run for an increased length of time until the gear 17 makes another complete turn, at which time the stud 18 rides against the end 19 of the lever and moves the  
 65 latter to place its stud 24 in the path of the

stud 23 and cause the two studs to engage for arresting the continued operation of the alarm-train.

The alarm mechanism may be thrown entirely out of service by a throw-off lever 44, 70 which is fulcrumed at 45 on the clock-casing and has one end extended through said casing for access outside of the same. The inner end of this lever 44 has an angular arm 46 arranged to press against that arm of the lever 75 40 which is in the path of the rotating finger 7. The lever 44 normally occupies a position wherein its arm 46 is free from the feed-lever 40 to allow the latter to be operated at the required time by the rotating finger 7; but to 80 throw the alarm mechanism out of service the operator merely pulls down on the outer end of the lever, thus moving the end 46 against one arm of the feed-lever 40 to shift the latter out of the path of the finger 7, the lever 85 44 being held in the desired position by any form of catch or fastener. (Not shown.)

To prevent backward movement of the ratchet 36 when it is turned by the pawl 38 and the feed-lever 40, I provide the check- 90 spring 47, which is attached to the frame 10 and engages with a tooth of the ratchet 36 in a way to allow the latter to be turned freely in one direction while holding it against rotation in the opposite direction. 95

It is evident that the operator can easily turn the alarm-dial 6 to make the pointer *d* indicate any number on said alarm-dial, and this operation of the dial shifts the position of the finger 7, which determines the period 100 of time that the alarm is to be operated.

Changes in the size, proportion, form, and minor details of construction may be made without departing from the spirit of the invention, and I therefore reserve the right to 105 make such alterations as fairly fall within the scope of the invention as defined by the annexed claims.

Having thus fully described my invention, what I claim as new, and desire to secure by 110 Letters Patent, is—

1. In an alarm-clock, the combination with a clock-movement, of an alarm-movement, locking devices for said alarm-movement, a cam for periodically releasing the locking de- 115 vices, and a step-by-step feed mechanism operable by the clock-movement for turning the cam at stated intervals.

2. In an alarm-clock, the combination with a clock-movement of a rotating element driven 120 by said clock-movement, locking devices for an alarm-movement, a lever and ratchet-feed mechanism interposed in the path of the rotating element, and a cam which at its second period of action produced by the ratchet- 125 wheel at the twenty-fourth hour instantaneously releases said locking devices.

3. The combination with a clock-movement, of an alarm-dial provided with a releasing member and adapted to be driven by said 130



clock-movement, an hour-hand having a pointer arranged to traverse the alarm-dial, said dial and the releasing member being shiftable at will, an alarm-movement, and a  
 5 step-by-step feed mechanism actuated by said releasing member for bringing the alarm-movement into service.

4. The combination with a clock-movement having an hour-hand arbor, of a sleeve revoluble with said arbor, a releasing member on  
 10 said sleeve, an alarm-dial on the sleeve, an hour-hand having a pointer for traversing the alarm-dial, an alarm-movement, and a step-by-step feed mechanism adapted to be actuated by said releasing member and operating  
 15 to release the alarm-movement, said feed mechanism being effective in releasing the alarm-movement a number of times during one winding thereof.

20 5. The combination with an alarm-movement, and a clock-movement, of a variable controlling-cam situated between said movements for releasing the alarm-movement at different predetermined intervals of time, said  
 25 cam consisting of members adjustable into coincident relation or into staggered positions, and a step-by-step feed mechanism actuated by the clock-movement for intermittently actuating the controlling-cam.

30 6. In combination with an alarm-movement and a clock-movement, a controlling-cam consisting of complementary members having projections and means for holding the members for rotation as a unit, and a step-by-step feed  
 35 mechanism actuated by the clock-movement for intermittently turning the cam and releasing the alarm-movement.

7. In combination with an alarm-movement, and a clock-movement, a controlling-cam having  
 40 complementary members held for adjustment into aligned and staggered relation one to the other, means actuated by the clock-movement for rotating the cam at intervals, and a step-by-step feed mechanism controlled by the  
 45 cam for releasing the alarm-train.

8. In combination with an alarm-movement, and a clock-movement, a controlling-cam, a step-by-step feed mechanism actuated by the  
 50 clock-movement for turning the cam at certain determined periods and in the intervals permitting it to remain at rest, and means controlled by the cam for releasing the alarm-movement.

9. In an alarm-clock, the combination of an  
 55 alarm-train, one wheel of which has a stud, said train including a pallet-wheel also provided with a stud, a lever having a beveled end and a stud which cooperate, respectively, with the stud of the alarm-train wheel and with  
 60 the pallet-wheel, and means for moving said lever.

10. In an alarm-clock, the combination of an alarm-train including a gear provided with a  
 65 stud and a pallet-wheel having a stud, a lever in the path of the stud on the alarm-train wheel

and provided with a stud in cooperative relation to the stud of the pallet-wheel, said alarm-train wheel being so proportioned relative to the other gears of the train as to make a number of revolutions before its stud acts on the  
 70 lever to place the stud thereof in the path of the stud on the pallet-wheel, and means for moving said lever.

11. In an alarm-clock, the combination with an alarm-train, of a locking-lever therefor, a  
 75 revoluble cam provided with a projection, a stud or arm projecting from said lever in the path of the projection on the cam, and a step-by-step feed mechanism for actuating the cam.

12. The combination with an alarm-train, of  
 80 a feed-lever, locking devices for the alarm-train, a cam operatively disposed to the releasing devices, a ratchet between the feed-lever and the cam, and a stop for preventing the ratchet from turning more than one tooth at  
 85 a time.

13. The combination with an alarm-train, of locking devices therefor, a rotating element driven by a clock-movement, a feed-lever in the  
 90 path of the rotating element, means for quickly retracting the feed-lever when cleared by the rotating element, and means actuated by the feed-lever to release the locking devices.

14. In an alarm-clock, the combination with an alarm-train, of a locking-lever provided  
 95 with a stud or arm and cooperating with a member of the train for arresting the latter, a cam in operative relation to the stud or arm of the lever, a ratchet for actuating the cam, a feed-lever, a pawl controllable by said feed-lever and operatively related to the ratchet,  
 100 and means for moving the feed-lever.

15. In an alarm-clock, the combination with an alarm-train, of a locking-lever therefor, a  
 105 cam cooperating with said lever, a ratchet revoluble with said cam, a feed-lever, a spring for moving the feed-lever in one direction, a pawl carried by the feed-lever and cooperating with the ratchet, and means for moving the feed-lever.  
 110

16. In an alarm-clock, the combination with an alarm-train, of a locking device therefor, a  
 115 feed-lever, means actuated by the feed-lever for releasing the locking device, and a throw-off lever arranged to operate the feed-lever and move it to an inactive position.

17. In an alarm-clock, the combination with an alarm-train, of a locking device therefor, a  
 120 spring-pressed feed-lever, a revoluble element driven by a clock-movement and arranged to operate the feed-lever, means actuated by the feed-lever for releasing the locking devices, and means acting on the feed-lever to move it out of the path of the clock-movement actuated means.  
 125

18. In an alarm-clock, the combination with an hour-hand arbor, and an hour-hand having  
 130 a pointer, of a sleeve frictionally engaging with said arbor and provided with a finger and an alarm-dial, an alarm-train, a locking device

therefor, and a feed-lever disposed in the path of the rotating finger and having coöperative relation to the locking device for releasing the alarm-train.

5 19. In an alarm-clock, the combination with an alarm-train, a locking device therefor, a cam provided with a ratchet, a stop-spring en-

gaging with said ratchet, a feed-lever, a pawl on said lever, and means for actuating the pawl.

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