

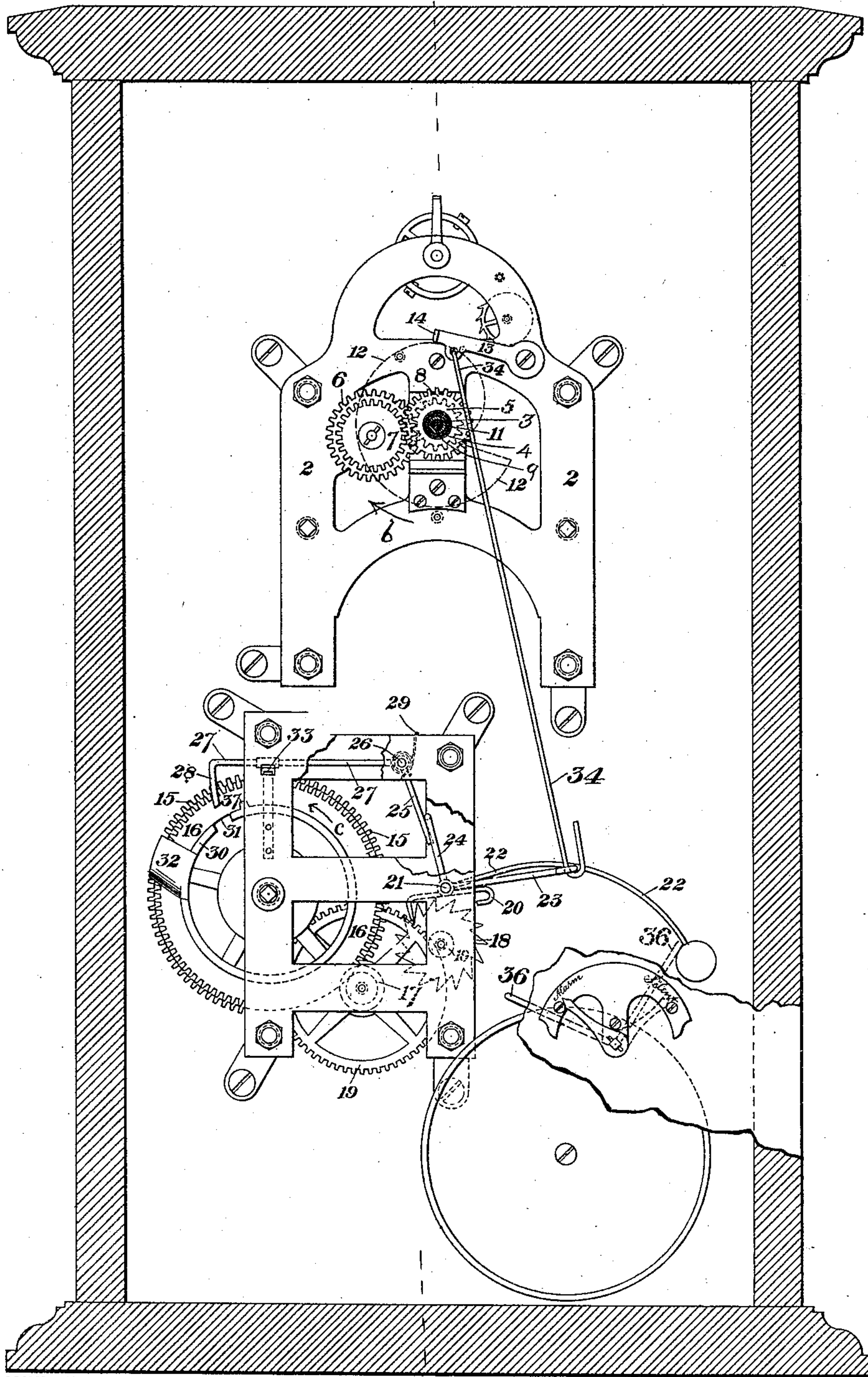
(No Model.)

2 Sheets—Sheet 1.

F. D. HOEHL.
ALARM CLOCK.

No. 467,109.

Patented Jan. 12, 1892.



WITNESSES

Fig. 1.
II

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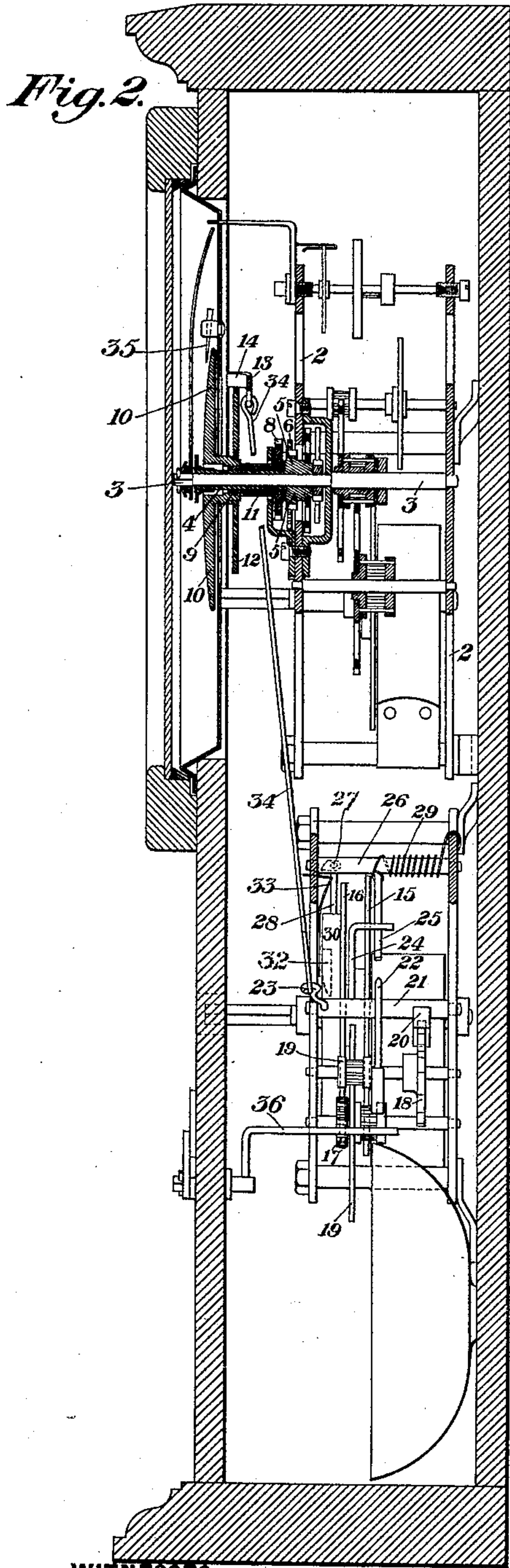
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A. L. Gill,
N. D. Conner

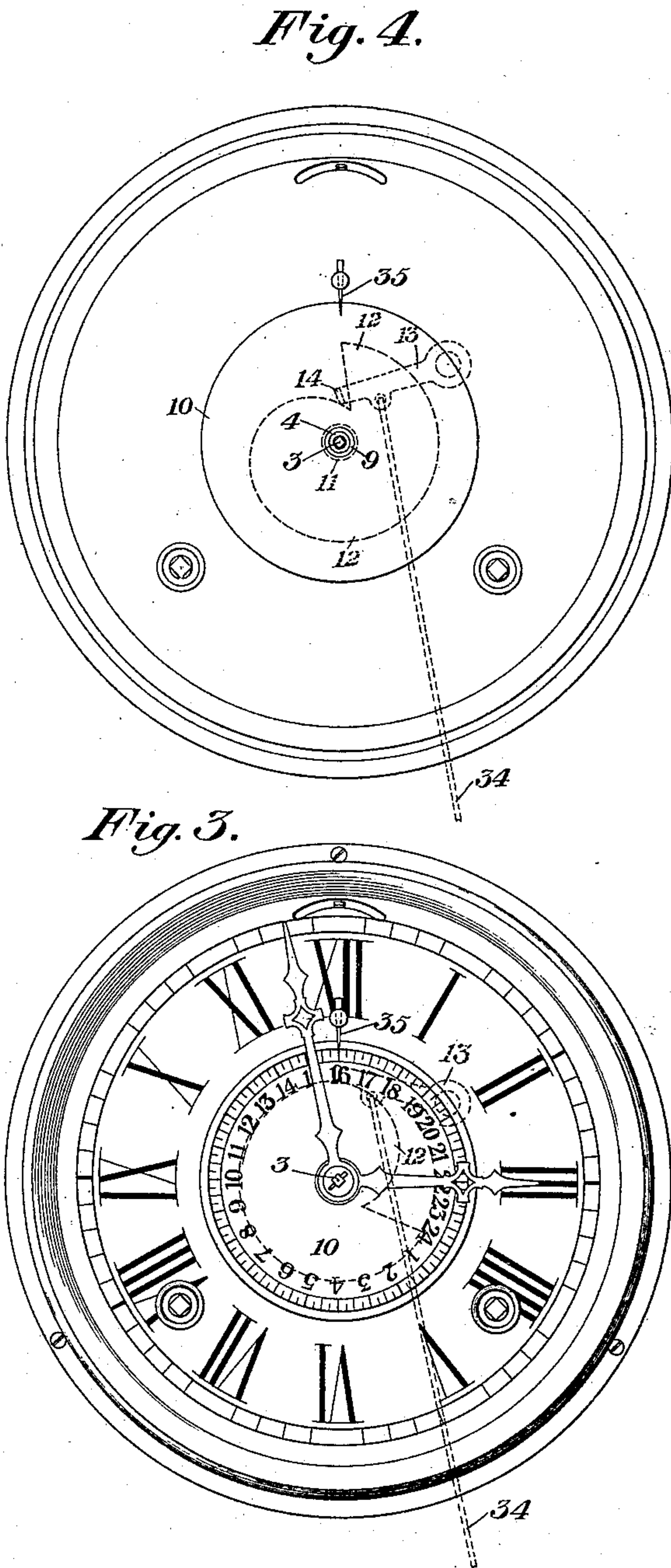
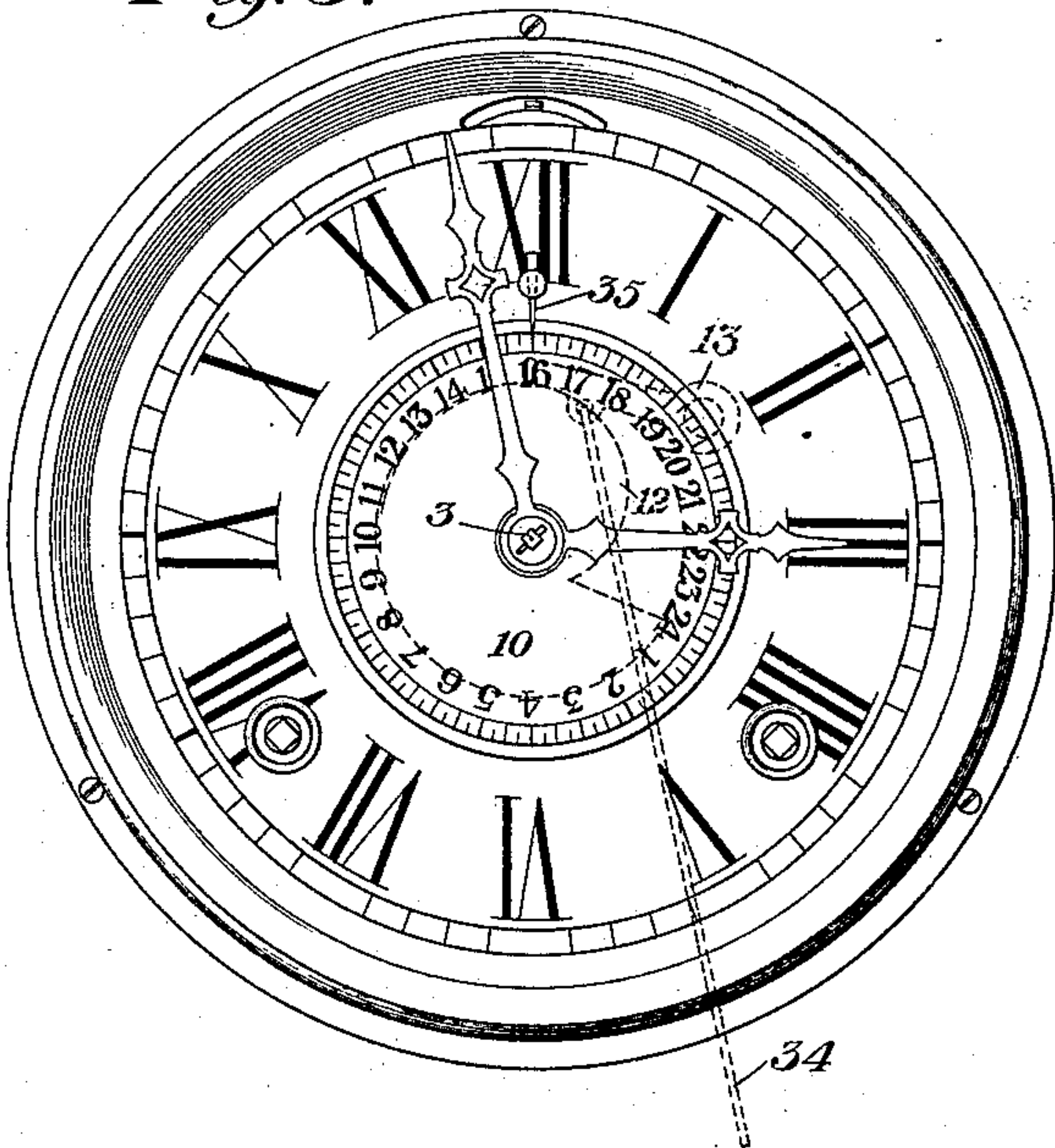


Fig. 3.



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UNITED STATES PATENT OFFICE.

FREDERICK D. HOEHL, OF PITTSBURG, PENNSYLVANIA.

ALARM-CLOCK.

SPECIFICATION forming part of Letters Patent No. 467,109, dated January 12, 1892.

Application filed January 22, 1890. Serial No. 337,682. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK D. HOEHL, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Alarm-Clocks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front elevation, partly in section, of an alarm-clock embodying my invention. Fig. 2 is a vertical section on the line II II of Fig. 1. Fig. 3 is a view of the dial of the clock. Fig. 4 is a similar view of part of the face, showing the clock mechanism in different positions.

In the drawings, 2 represents the frame of the clock-movement.

3 is the minute-hand arbor, and 4 the usual tubular hour-hand spindle.

The parts of the clock mechanism by which the hands are operated may be of any usual construction, and it is therefore unnecessary that I should describe or show the same in detail.

In the drawings my improvement is shown applied to a clock with a lever-movement; but it should be understood that it may be used as well with pendulum clocks.

5 is a pinion, which is fixed to the hour-hand spindle and is in gear with a toothed wheel 6, having twice the number of teeth.

7 is a toothed wheel fixed to the wheel 6 and meshing with a toothed wheel 8. The last-named wheel is provided with a sleeve 9 set loosely on the hour-hand spindle 4, so that the wheel and its sleeve shall be capable of rotation independently thereof. The wheels 7 and 8 are formed with the same number of teeth, and therefore the motion communicated to the wheel 8 and its sleeve by the wheels 5, 6, and 7 is such that the wheel 8 shall perform one revolution in the time occupied by two revolutions of the hour-hand.

10 is a dial having a sleeve 11, which fits over the sleeve 9 with sufficient tightness so that normally the dial shall revolve with said sleeve 9, but loosely enough to permit the dial to be turned independently for the purpose of setting the alarm-movement, as hereinafter described.

12 is a cam fixed to the sleeve 11 of the

dial 10. Its shape is sufficiently shown in the drawings.

From the foregoing description it will be apparent that in the action of the clock the dial 10 and its cam will revolve once in each period of twenty-four hours.

13 is a lever pivoted to the frame 2 and provided with a tongue 14, which fits against the periphery of the cam.

The alarm-movement comprises the following parts: a toothed wheel 15, which is driven primarily by the spring of the alarm-movement, and a wheel 16, loosely mounted on the shaft of the wheel 15 and mechanically connected therewith by a gear-wheel 17, so as to rotate at a faster rate of speed.

18 is an escapement-wheel, which is connected with the shaft of the wheel 17 by gearing 19, by which it is rotated at a relatively rapid rate. The escapement-lever 20 is fixed to a spindle 21, from which projects the bell-clapper lever 22, a lever 23, and a short arm 24, which is adapted to be engaged and to be locked by an arm 25, which projects from a spindle 26. This spindle 26 has an arm 27, which is provided at its end with a tongue 28 and is fitted with a spring 29, which tends to force said tongue toward the periphery of a ring 30 on the face of the gear-wheel 16. Said ring is provided with a peripheral slot 31 and with a projecting cam 32, which is adapted in the travel of the ring to engage and to lift a spring-catch 33, which normally holds the arm 27 out of contact with the ring. The lever 13 is connected with the lever 23 by a rod 34.

The operation of the device is as follows: With the parts in the position shown in Fig. 1, the bearing of the lever 13 on the periphery of the cam will uphold said lever, and through the rod 34 and arm 23 will hold the escapement-lever 20, so as to prevent the alarm from sounding. As before explained, the cam 12 rotates in the direction of the arrow b, performing one revolution in each twenty-four hours. When in its rotation the cut-out portion of the cam comes opposite to the position of the tongue 14 of the lever 13, said lever will be freed from the action of the cam, thus releasing the arm 23 and the escapement-lever 20. The escape-wheel 18 will

thereupon begin to revolve rapidly and to agitate the clapper-lever, so as to sound the alarm, and the wheel 16 will revolve in the direction of the arrow *c*. When in the revolution of the ring 30 with the wheel 16 the cam 32 comes into engagement with the spring-catch 33, it will uplift said catch, so as to free the arm 27 and to permit it to be moved by its spring so as to bring the end of the tongue 28 into engagement with the periphery of the ring. Then as the wheel 16 continues to revolve it will eventually bring the slot 31 opposite to the end of said tongue, the arm 27 will move farther, and its tongue will enter said slot, its motion being limited by a lug 37 on the ring. This inward motion of the arm 27 throws the arm 25 outwardly and causes it to engage the arm 24 of the escapement-lever, thereby locking said arm and immediately stopping the sounding of the alarm; but as the arm 27 is stopped by the lug 37 the clapper-lever will be held from contact with the bell, thus permitting the sonorous vibration of the latter to continue. The position of the cam 12 and lever 13 at this time is shown in Fig. 4. The alarm will not be sounded again until the lapse of a period of twenty-four hours, during which time the operation of its parts is as follows: As the cam 12 slowly revolves in performing its daily single revolution, the eccentricity of its periphery will gradually lift the lever 13 into the position shown in Figs. 1 and 3 with the following results: The lifting of the lever drawing on the rod 34 will lift the lever 23, and through the arm 24 will move the arm 25 so as to turn the arm 27 on its axis and to raise its tongue 28 from the slot 31, moving said arm far enough to pass the spring-catch 33, which thereupon springs down and holds the arm in the position shown in Fig. 1, thereby putting the parts in readiness for sounding another alarm and transferring the function of locking the alarm-escapement-lever from the arm 25 to the lever 13, which, so long as it is upheld by the cam, will prevent the sounding of the alarm. To permit these movements of the parts, I make the teeth of the escapement-wheel 18 of considerable depth, as shown in Fig. 1. The operation of the parts is then the same as above described. When after the lapse of twenty-four hours from the time of the last alarm the cut-away portion of the cam comes opposite to the lever 13, the freeing of the lever will permit it to drop into the position shown in Fig. 4, thereby releasing the escapement-lever of the alarm-movement and permitting the alarm to sound in the manner hereinbefore described.

I shall now describe the means which I employ for setting the alarm mechanism. The dial 10 is divided into twenty-four equal divisions, which are marked, preferably, with figures 1 to 24, inclusive, and the mark 24 is put exactly opposite to the edge of the cut-out portion of the cam. The face of the

clock-dial is also provided with a mark or pointer 35, the end of which is at the position of the tongue on the lever 13. It follows, therefore, that when the alarm is sounded the 24-mark on the dial 10 must be precisely at the position of the pointer 35. This affords an efficient means for setting the alarm, for as each of the divisions of the dial 10 is equal to its arc of movement in the space of one hour, by turning the dial so as to remove the 24-mark from the pointer an arc of a certain number of divisions it will be known that the 24-mark will reach the pointer and that the alarm will be sounded in just the number of hours indicated by the number of divisions of said arc. Thus if it be three o'clock p. m., as indicated by the hands in Fig. 3, and if it be desired to sound the alarm at seven o'clock the next morning, a period of sixteen hours following, the alarm is set by turning the dial so as to bring the 16-mark opposite to the pointer, since thereby the 24-mark is removed sixteen divisions from the pointer, and sixteen hours must elapse before the parts are brought into position to sound the alarm.

An additional improvement which is desirable consists in the use of a lever 36, which is journaled to the clock-frame and has an arm situated at the outside of the latter, said lever being so arranged that when turned into the position shown by dotted lines in Fig. 1 it shall engage the clapper-lever, so as to prevent the alarm from being sounded. By this means the alarm mechanism may be disused as long as may be desired.

The advantages of my improvement will be appreciated by those skilled in the art.

My improvement affords a clock which sounds an alarm but once in twenty-four hours, and which on this account is much more desirable than those alarm-clocks which must sound within twelve hours after they are set and which must be wound up daily.

By the use of the stopping device of my clock the alarm mechanism sounds for a short time only and is then stopped, so that it does not require frequent winding, and by using an alarm-movement spring of sufficient size and strength the alarm may be caused to be operative for a period of eight days or more and to sound an alarm once each day without resetting or rewinding.

The items of invention which I desire to cover are concisely and individually summarized in the following claims.

I claim—

1. In a clock, the combination, with the clock-movement geared to complete one cycle of motion of the hour-hand in twelve hours, of an alarm-movement, a cam controlling the alarm-movement, a train of gearing connecting the cam and the clock-movement and constructed to rotate the cam once in twenty-four hours, and an alarm-setting dial fixed to the cam and rotating with it at an equal rate,

said dial being provided with twenty-four setting-divisions, substantially as and for the purposes described.

2. In a clock, the combination, with the
5 clock-movement geared to complete one cycle of the hour-hand in twelve hours, of an alarm-movement, a cam arranged loosely upon the hour-hand spindle and controlling the alarm-movement, the train of gear-wheels 5, 6, 7, and
10 8, connecting the hour-hand spindle and the cam and converting the twelve-hour cycle of motion of the said spindle into a twenty-four-hour cycle of motion of the cam, and an alarm-setting dial fixed to the cam and rotating
15 therewith at an equal rate, said dial being provided with twenty-four setting-divisions, substantially as and for the purposes described.

3. In a clock, the combination, with the
20 alarm-escapement, of a lever for stopping the same, a catch for holding said lever, a cam or

projection 32, which disengages the catch and permits the stopping-lever to come into action, and a cam mechanically connected with the escapement-lever and operated by the clock- 25 movement to lock the alarm-escapement and to move the stopping-lever into the path of the catch, substantially as and for the purposes described.

4. In a clock, the combination, with the 30 alarm-escapement, of a lever for stopping the same, a catch for holding said lever, a cam or projection 32, which disengages the catch and permits the stopping-lever to come into action, and a lug or stop 37 for the stopping-lever, sub- 35 stantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 9th day of January, A. D. 1890.

FREDERICK D. HOEHL.

Witnesses:

W. B. CORWIN,
JNO. K. SMITH.