July 24, 1934. M. SCHLENKER 1,967,995

ALARM CLOCK

Filed July 3, 1933 3 Sheets-Sheet 1

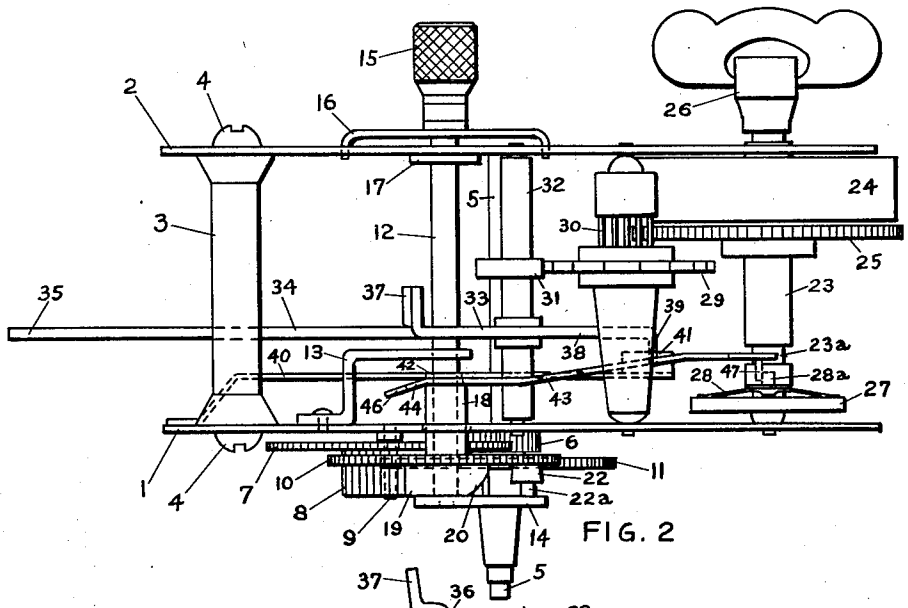


FIG. 2

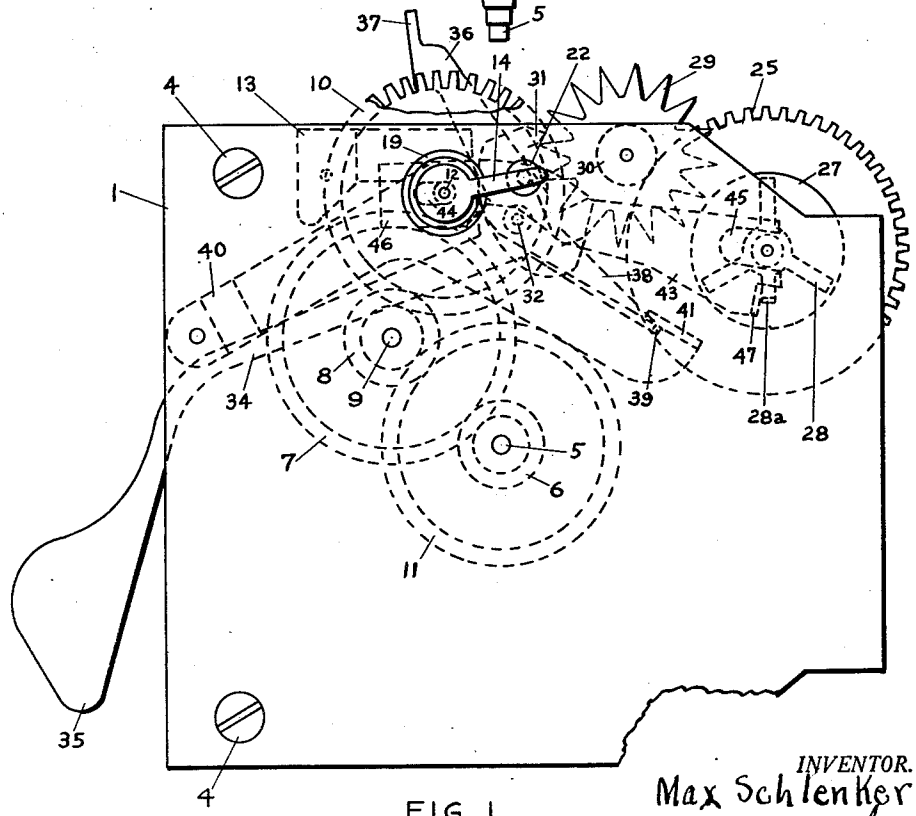


FIG. 1

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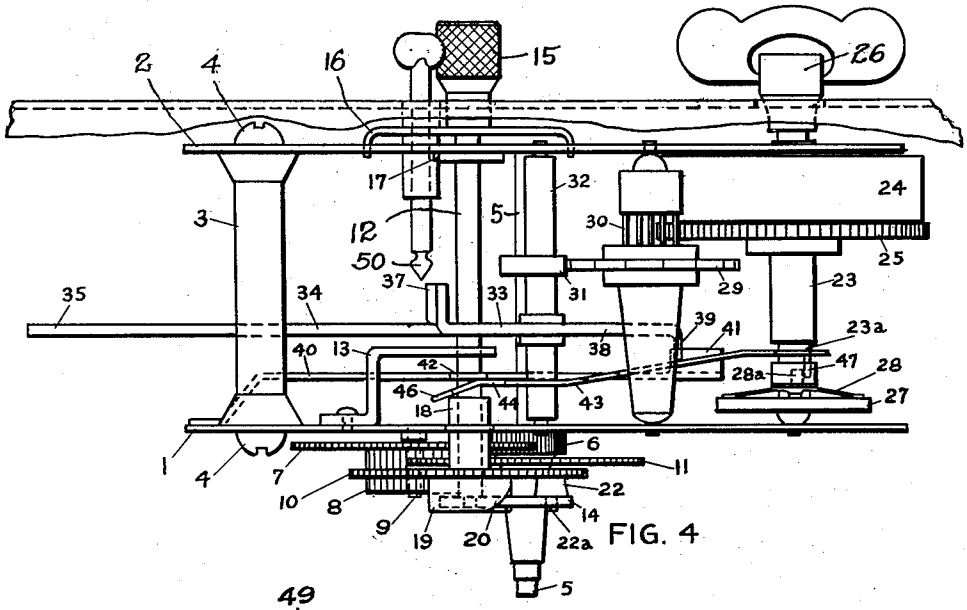


FIG. 4

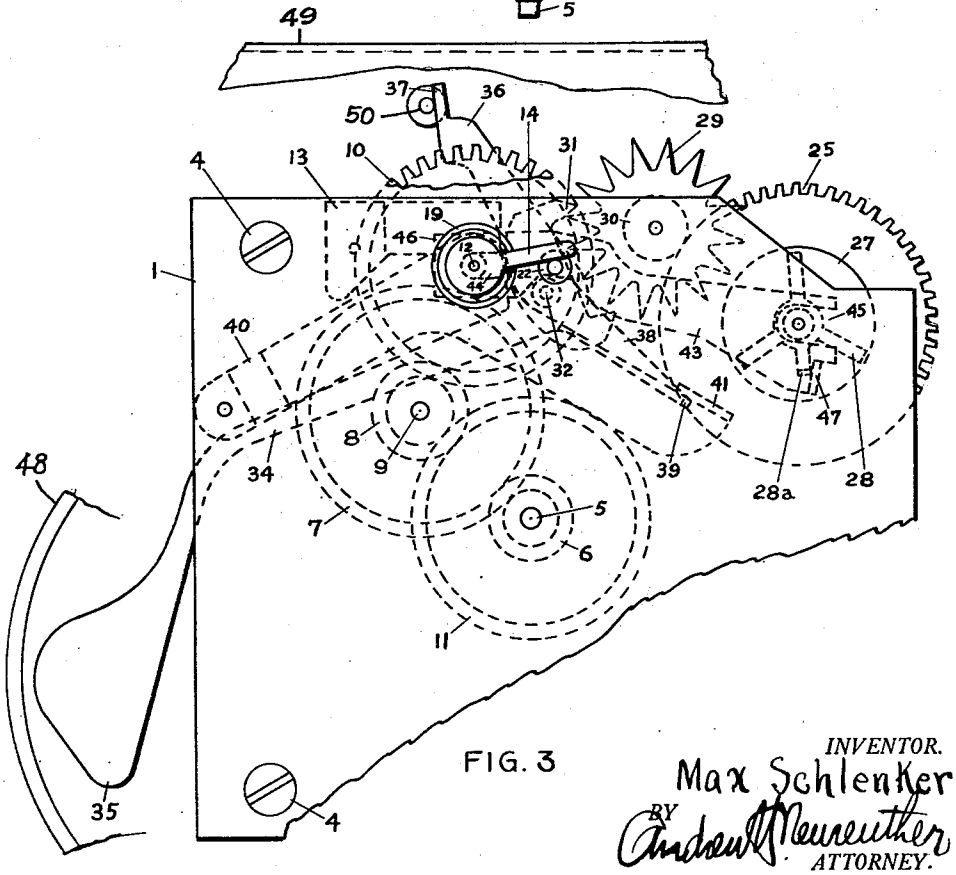


FIG. 3

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ALARM CLOCK

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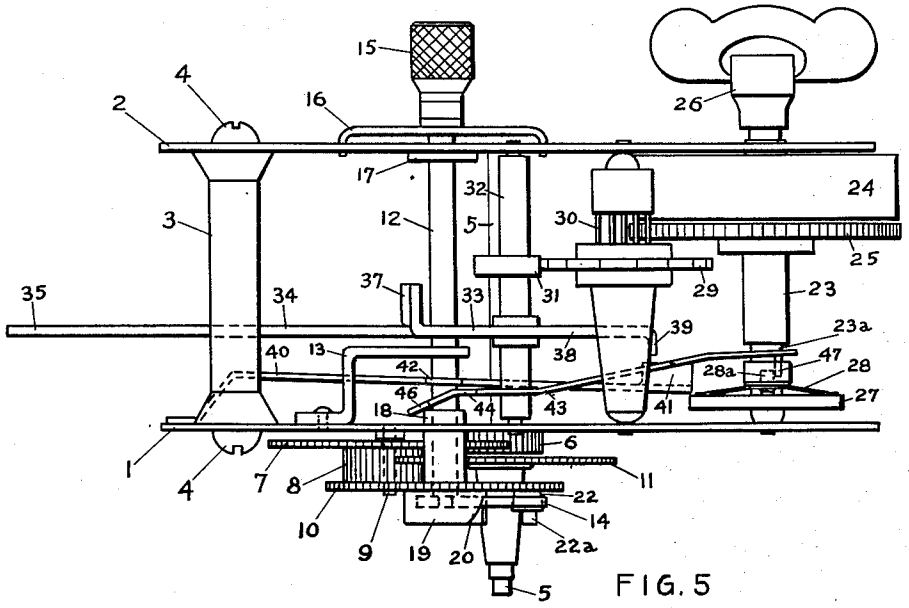


FIG. 5

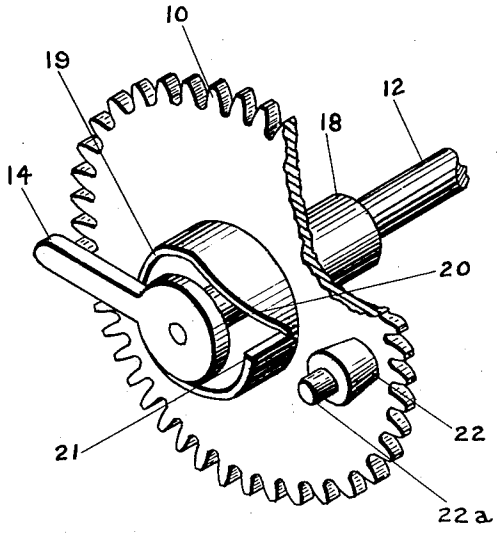


FIG. 6

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UNITED STATES PATENT OFFICE

1,967,995

ALARM CLOCK

Max Schlenker, La Salle, Ill., assignor to Western Clock Company, Peru, Ill., a corporation of Illinois

Application July 3, 1933, Serial No. 678,833

12 Claims. (Cl. 58—16)

My invention relates to alarm clocks and has for its object the production of an alarm clock which sounds two alarms, one of which is sounded for a short interval only and automatically shut-off to first awaken the sleeper and then give him an opportunity to adjust himself to normalcy and thus prepare to arise, and to manually shut off the alarm mechanism. Should the sleeper, however, during this period of adjustment fall asleep again the second alarm which will sound after a definite period say ten minutes after the first alarm sounds and for a much longer period that will definitely awaken the sleeper and cause him to arise and shut-off the second alarm.

I accomplish these objects by the means shown in the accompanying drawings in which:

Fig. 1 is a partial front view of a clock movement showing the alarm mechanism before it has functioned.

Fig. 2 is a partial top view of the same.

Fig. 3 is a partial front view of a clock frame with the movement showing the alarm mechanism after the preliminary alarm has functioned.

Fig. 4 is a partial top view of the same.

Fig. 5 is a partial top view of a clock movement showing the alarm mechanism during the operation of the longer alarm.

Fig. 6 is an enlarged perspective view of my trip wheel assembly.

Similar numerals represent the same parts throughout the several views.

In the drawings 1 represents the front frame plate and 2 the rear frame plate of the clock movement. Said plates 1 and 2 are mounted on, and held in proper position by the pillars 3 and pillar screws 4. Journally mounted in plates 1 and 2 is the minute hand or center shaft 5 which carries the pinion 6. Said center shaft 5 is driven in clockwise direction by the usual spring powered clock movement, which is not shown. Said pinion 6 engages the intermediate gear wheel 7 which has integral therewith the pinion 8 and is mounted on the stud 9. Said pinion 8 engages gear wheel 10 and the gear wheel 11. Gear wheels 10 and 11 are the usual trip wheel and hour wheel respectively of my alarm clock and are of equal pitch and size and are in such ratio as to rotate once in twelve hours in the usual alarm clock.

The trip wheel 10 is rotatably and slidably mounted on the shaft 12 which shaft 12 as is usual is journally and frictionally mounted in frame plate 2 and bearing bracket 13 attached to frame plate 1. Said shaft 12 has mounted at its front end the trip finger 14 and at its rear end the knurled knob 15. Said shaft 12 is frictionally held in any position of rotation by means of the friction spring 16 and the stop collar 17, as shown. Said trip wheel 10 has fastened thereto the sleeve 18 and the trip cam 19. Said trip cam 19 has a cam lobe 20 and a shoulder 21 (see Fig. 6). Mounted on trip wheel 10 is the shouldered pin 22 which has a central part 22*a* so disposed that it lies under the trip finger 14 when in the position shown in Figs. 1 and 2. Said pin 22 is undercut or conical in shape, as shown.

Journally mounted in plates 1 and 2 is the alarm spring arbor 23 which carries the usual coiled spring 24, gear wheel 25 and winding key 26. Said arbor 23 has a recess 23*a* cut therein and further carries the disc 27 rigidly attached. Adjacent to and bearing upon said disc 27 is the friction spider 28 which is made of resilient material shaped with arms as shown and being frictionally mounted on arbor 23 can be rotated with respect to the disc 27. Said spider 28 has the projection 28*a* on one of its arms, as shown.

Journally mounted in plates 1 and 2 is the escapement wheel 29 whose pinion 30 engages the gear wheel 25. The teeth of said escapement wheel 29 engage the teeth of the verge 31. Said verge 31 is mounted on the shaft 32 which is journally mounted in plates 1 and 2. Mounted on said shaft 32 is the member 33 comprising three levers or projections 34, 36 and 38, as shown. Lever 34 extends beyond the edge of the movement plates and has formed at its extremity the hammer 35 which strikes the usual bell 48. Lever 36 also extends beyond the edge of the movement plates and has the projection 37 formed at its extremity. Said projection 37 serves as a means for engaging the usual manual shut-off of the alarm system shown at 50 mounted in the casing indicated at 49. Lever 38 has formed at its extremity the right angled projection 39, as shown.

Fastened to movement plate 1, as shown, is the spring member 40. Said spring member 40 has a right angled projection 41, so disposed that it engages the projection 39 of lever 38 when in the position shown in Figs. 1 and 2. Said spring member 40 further has a large aperture 42 through which the shaft 12 passes. Said spring member 40 is so positioned that it exerts a pressure against the sleeve 18 through the member 43 which is interposed between said spring member 40 and the sleeve 18. Said member 43 is slidably mounted on the shaft 12 and the spring

arbor 23. The member 43 has an elongated aperture 44 through which the shaft 12 passes and a slot 45 by means of which said member 43 passes into and engages the recess 23*a* in the spring arbor 23. The end of said member 43, adjacent to shaft 12, is bent to form an angular projection 46. At the other end of member 43 is formed the right angled projection 47, so disposed as to always lie in the path of projection 28*a* of spider 28.

In operation my alarm mechanism functions as follows:

Referring to Fig. 1 which shows the mechanism of the clock just before the preliminary alarm operates, it will be seen that the shouldered pin 22 has its centrally disposed part 22*a* directly under the trip finger 14. Said trip wheel 10 is synchronized exactly with the hour wheel 11 and as it moves in clockwise direction said trip wheel 10 carries the shoulder 21 of trip cam 19 out from under the trip finger 14 permitting the centrally disposed end 22*a* of pin 22 due to the pressure from the spring member 40 on the sleeve 18 to rest against the trip finger 14. As the clockwise rotation of the trip wheel 10 continues the end 22*a* of the shouldered pin 22 moves out from under the trip finger 14 permitting said trip wheel 10 to move away from movement plate 1 until the shouldered part of pin 22 rests against the trip finger 14, the shoulder 21 of trip cam 19 having already cleared the trip finger 14, as above mentioned. Said movement of trip wheel 10 permits a corresponding movement of the spring member 40 in the same direction until the projection 41 of spring member 40 no longer engages the projection 39 of lever 38. This disengagement permits the escapement wheel 29 to rotate and vibrate member 33 and the preliminary alarm operates. When the alarm spring arbor 23 has thus turned one revolution in counter-clockwise direction the projection 28*a* of spider 28 has moved its position from outside of projection 47 on member 43 (see Fig. 1) to a point inside of said projection 47 of member 43 (see Fig. 3). Said projection 28*a* engaging the inside surface of projection 47 of member 43 causes a longitudinal movement to the right of said member 43 as far as the slotted aperture 44 will permit. Said longitudinal movement of member 43 causes the angular projection 46 of said member 43 to be drawn over the edge of sleeve 18 with the result that the spring member 40 is forced back away from movement plate 1 and the inner edge of sleeve 18 until the projection 41 of spring member 40 again engages projection 39 of lever 38 thus locking the escapement and terminating the preliminary alarm.

As the clockwise rotation of the trip wheel 10 continues the shoulder of pin 22 moves out from under the trip finger 14 permitting said trip wheel 10 to move still further away from movement plate 1 until the bottom of lobe 20 of trip cam 19 is in contact with the trip finger 14. Said further movement of trip wheel 10 again permits a corresponding movement of spring member 40 in the same direction until the projection 41 of spring member 40 no longer engages the projection 39 of lever 38. This disengagement permits the escapement wheel 29 again to function and bring the second or longer alarm into operation (see Fig. 5).

The projection 28*a* of spider 28 being in contact with the inner surface of projection 47 of member 43 and said spider 28 being frictionally attached to disc 27 and spring arbor 23, said spider 28 remains stationary as the spring arbor 23 rotates counter-clockwise during the ensuing escapement which continues until the spring has run down or the alarm escapement is manually shut-off by the usual means engaging the lever 36. As the further clockwise rotation of the trip wheel 10 continues the lobe 20 of trip cam 19 engages the trip finger 14 and said trip cam 19 together with the trip wheel 10 and the sleeve 18 are forced toward the movement plate 1 until said trip finger 14 engages the top of trip cam 19. This position of the trip wheel 10 forces the spring member 40 away from the movement plate 1 and engages the projection 41 of said spring member 40 with the projection 39 of lever 38, again automatically locking the escapement.

When the alarm spring 24 is again wound by means of the winding key 26 in clockwise direction (Figs. 1 and 3) the spider 28 rotates with the spring arbor 23 until the projection 28*a* again engages the outer surface of projection 47 of member 43 and said member 43 is given a longitudinal movement to the left as far as the slotted aperture 44 will permit. Said longitudinal movement of member 43 causes the angular projection 46 of said member 43 to be pushed back over the edge of sleeve 18 to its original position as shown in Fig. 1. Said longitudinal movement of member 43 is accomplished by the first rotation of spring arbor 23 during the manual winding. Subsequent turns of said spring arbor 23 cause the spider 28 to slip on the disc 27 owing to the engagement of projection 28*a* with the outer surface of projection 47 of member 43.

The entire mechanism is thus restored to its original position as shown in Figs. 1 and 2 and is in readiness to repeat the cycle above described.

It will be understood, of course, that while I have here shown one form of my invention, I do not wish to limit myself to the exact construction shown, but wish to have it taken in a sense illustrative of any or all the forms of my invention that come fairly within the scope of the appended claims.

I claim:

1. In combination, a time movement and an alarm mechanism comprising a spring power shaft journaled in said time movement with a power spring mounted thereon and a hammer with actuating means therefor and a bell, a hammer locking means; preliminary releasing means on said time movement for disengaging said hammer locking means to sound one alarm at a predetermined time, intermediate means movably mounted adjacent to said shaft and to said hammer locking means adapted to re-engage said hammer locking means to stop the sounding of said alarm, mechanism on said shaft to actuate said intermediate means, and auxiliary means co-acting with said preliminary releasing means whereby said hammer locking means is again disengaged to sound a second alarm after a definite time interval has elapsed after the said first alarm has sounded.

2. In combination, a time movement and an alarm mechanism comprising a spring power shaft journaled in said time movement with a power spring mounted thereon and a hammer with actuating means therefor and a bell, a hammer locking means, preliminary releasing means on said time movement for disengaging said hammer locking means to sound one alarm at a predetermined time, a member movably mounted adjacent to said shaft and to said hammer locking means adapted to reengage said hammer lock-

ing means to stop the sounding of said alarm, mechanism on said shaft to actuate said member, and co-acting auxiliary means forming a part of said preliminary releasing means whereby said hammer locking means is again disengaged to sound a second alarm after a definite time interval has elapsed after the said first alarm has sounded.

3. In combination, a time movement and an alarm mechanism comprising a spring power shaft journaled in said time movement with a power spring mounted thereon and a hammer with actuating means therefor and a bell, a hammer locking means, preliminary releasing means on said time movement for disengaging said hammer locking means to sound one alarm at a predetermined time, a member mounted adjacent to said shaft and to said hammer locking means adapted to reengage said hammer locking means to stop the sounding of said alarm, mechanism on said shaft to actuate said member, co-acting auxiliary means actuated by said preliminary releasing means whereby said hammer locking means is again disengaged to sound the alarm after a definite time interval has elapsed after the first alarm has sounded and manual means for the stopping of said alarm.

4. In combination, a time movement and an alarm mechanism comprising a spring power shaft journaled in said time movement with a power spring mounted thereon and a hammer with actuating means therefor and a bell, preliminary releasing means on said time movement for freeing said hammer to sound one alarm at a predetermined time, intermediate means mounted adjacent to said shaft and to said releasing means to automatically stop the sounding of said alarm, mechanism on said shaft to actuate said intermediate means, and auxiliary means co-acting with said preliminary releasing means whereby said hammer is released to sound the alarm after a definite time interval has elapsed after the first alarm has sounded, said intermediate means being returned to its original operative position to sound the first alarm when said power spring is rewound.

5. In combination, a time movement and an alarm mechanism comprising a spring power shaft journaled in said time movement with a power spring mounted thereon and a hammer with actuating means therefor and a bell, preliminary releasing means on said time movement for freeing said hammer to sound one alarm at a predetermined time, a member movably mounted adjacent to said shaft and to said releasing means to automatically stop the sounding of said alarm, mechanism on said shaft to move said member thereto as aforesaid during the time the first alarm is sounded and auxiliary means co-acting with said preliminary means whereby said hammer is released to sound a second alarm after a definite time interval has elapsed after the first alarm has sounded, said member being returned to its original operative position to sound the first alarm when said power spring is rewound.

6. In combination, a time movement and an alarm mechanism comprising a spring power shaft journaled in said time movement with a power spring mounted thereon and a hammer with actuating means therefor and a bell, preliminary releasing means on said time movement for freeing said hammer to sound one alarm at a predetermined time, intermediate means movably mounted adjacent to said shaft and to said releasing means to automatically stop the sounding of said alarm, mechanism on said shaft to move said intermediate means thereto as aforesaid during the time the first alarm is sounded and auxiliary means co-acting with said preliminary means whereby said hammer is released to sound the alarm after a definite time interval has elapsed after the first alarm has sounded, said intermediate means being returned to its original operative position to sound the first alarm when said power spring is rewound and manual means for stopping said alarm.

7. In combination, a time movement and an alarm mechanism comprising a spring power shaft journaled in said time movement with a power spring mounted thereon and a hammer with actuating means therefor and a bell, preliminary releasing means on said time movement for freeing said hammer to sound one alarm at a predetermined time, a member movably mounted adjacent to said shaft and to said releasing means, co-acting means on said member comprising a projection and a cam to stop the sounding of said alarm, frictionally mounted means on said shaft to engage said projection to move said member and co-acting auxiliary means forming a part of said preliminary means whereby said hammer is released to sound a second alarm after a definite time interval has elapsed after the first alarm has sounded.

8. In combination, a time movement and an alarm mechanism comprising a spring power shaft journaled in said time movement with a power spring mounted thereon and a hammer with actuating means therefor and a bell, preliminary releasing means on said time movement for freeing said hammer to sound one alarm at a predetermined time, a member having a projection and a cam, movably mounted adjacent to said shaft and to said releasing means to automatically stop the sounding of said alarm, frictionally mounted means on said shaft to move said member, co-acting auxiliary means actuated by said preliminary means whereby said hammer is released to sound a second alarm after a definite time interval has elapsed after the first alarm has sounded, and manual means for stopping said alarm.

9. In combination, a time movement and an alarm mechanism comprising a spring power shaft journaled in said time movement with a power spring mounted thereon and a hammer with actuating means therefor and a bell, preliminary releasing means on said time movement for freeing said hammer to sound one alarm at a predetermined time, a member having a projection and a cam movably mounted adjacent to said shaft and to said releasing means to automatically stop said hammer from sounding the alarm, frictionally mounted means on said shaft to move said member, and auxiliary means co-acting with said preliminary means whereby said hammer is released to sound a second alarm after a definite time interval has elapsed after the first alarm has sounded, said member being returned to its original operative position to sound the first alarm when said power spring is rewound.

10. In combination, a time movement and an alarm mechanism comprising a spring power shaft journaled in said time movement with a power spring mounted thereon and a hammer with actuating means therefor and a bell, preliminary releasing means on said time movement

for freeing said hammer to sound one alarm at a predetermined time, a member having a projection and a cam, movably mounted adjacent to said shaft and to said releasing means to automatically stop said hammer from sounding the alarm, frictionally mounted means on said shaft to move said member, auxiliary means co-acting with said preliminary means whereby said hammer is released to sound a second alarm after a definite time interval has elapsed after the first alarm has sounded, said member being returned to its original operative position to sound the first alarm when said power spring is rewound and manual means for stopping said alarm.

11. In combination, a time movement and an alarm mechanism comprising a spring power shaft journaled in said time movement, with a power spring mounted thereon and a hammer with actuating means therefor and a bell, preliminary releasing means on said time movement for freeing said hammer to sound one alarm at a predetermined time, a member, having a projection and a cam, slidably mounted on said shaft adjacent to said projection and on said releasing means adjacent to said cam co-acting with said releasing means to stop the hammer from sounding the alarm, frictionally mounted means on said shaft to move said member thereto and auxiliary means co-acting with said preliminary means whereby said hammer is released to sound a second alarm after a definite time interval has elapsed after the first alarm has sounded, said member being returned by said frictional means to its operative position to sound the first alarm when said power spring is rewound.

12. In combination, a time movement and an alarm mechanism comprising a spring power shaft journaled in said time movement with a power spring mounted thereon and a hammer with actuating means therefor and a bell, preliminary releasing means on said time movement for freeing said hammer to sound one alarm at a predetermined time, a member, having a projection and a cam, slidably mounted on said shaft adjacent to said projection and on said releasing means adjacent to said cam co-acting with said releasing means to stop the hammer from sounding the alarm, frictionally mounted means on said shaft to move said member thereto, auxiliary means co-acting with said preliminary means whereby said hammer is released to sound a second alarm after a definite time interval has elapsed after the first alarm has sounded, said member being returned by said frictional means to its operative position to sound the first alarm when said power spring is rewound and manual means for stopping said alarm.

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