May 28, 1935. C. JAUCH 2,002,998

ALARM CLOCK

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Fig. 1

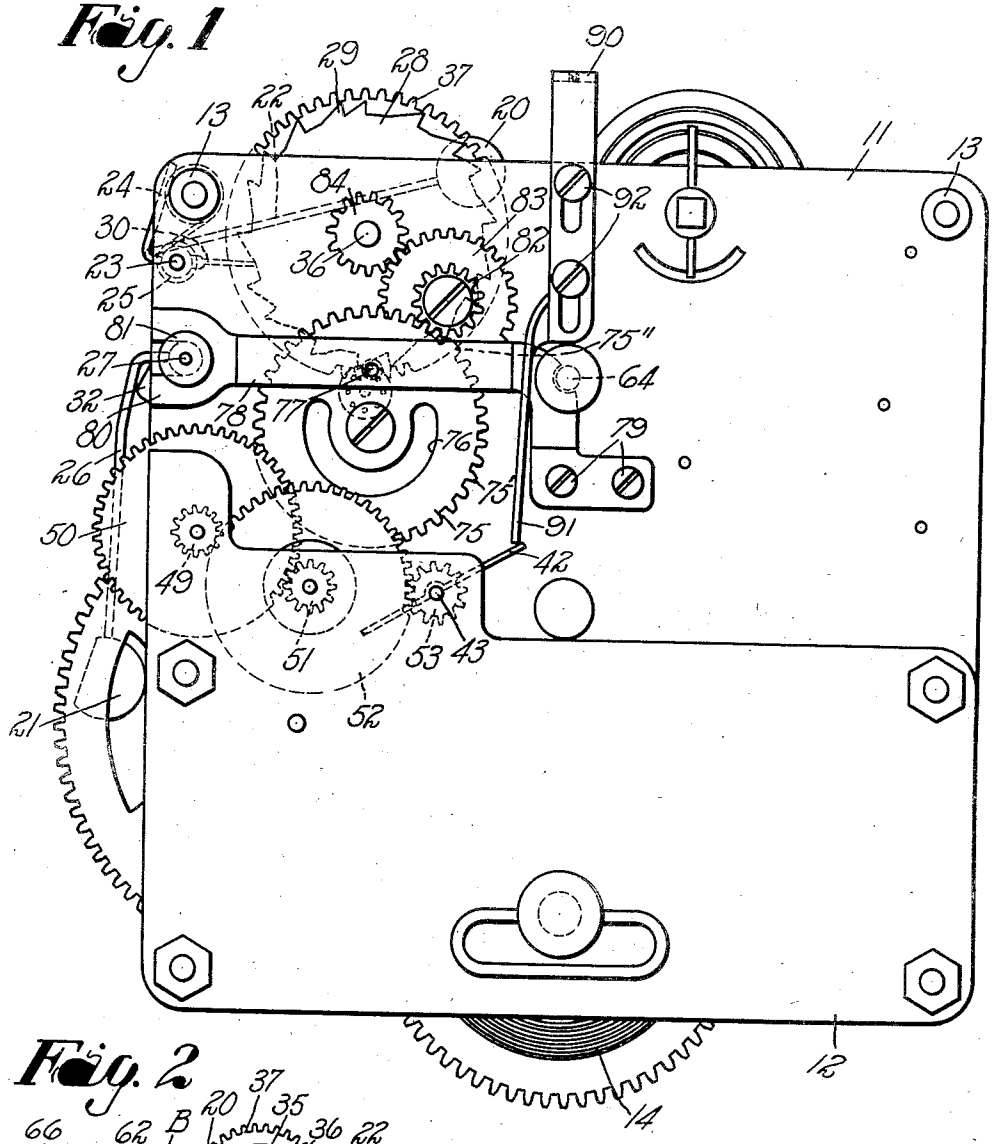
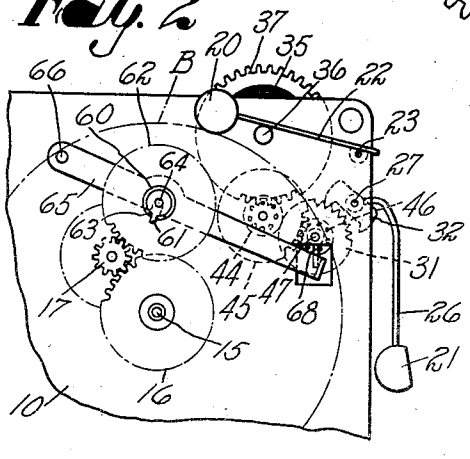


Fig. 2



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ALARM CLOCK

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Fig. 4

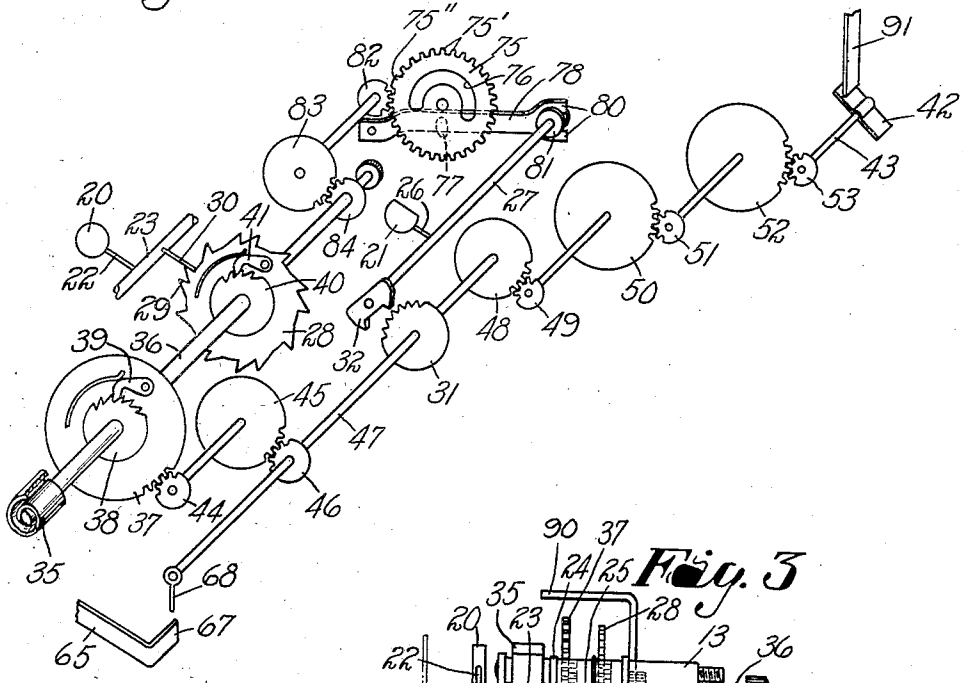
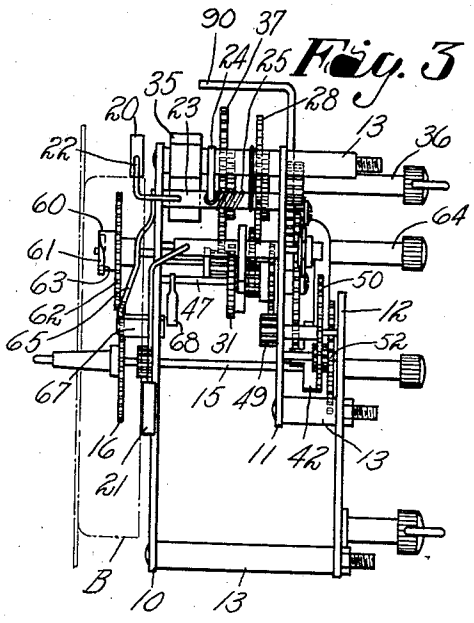


Fig. 3



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UNITED STATES PATENT OFFICE

2,002,998

ALARM CLOCK

Christian Jauch, Winsted, Conn., assignor to William L. Gilbert Clock Company, Winsted, Conn., a corporation of Connecticut

Application April 6, 1933, Serial No. 664,730

3 Claims. (Cl. 58—16)

This invention relates to alarm clocks and has particular reference to alarm mechanism for giving a more or less gentle audible signal at the predetermined time in order to wake the sleeper without unduly startling him, and a subsequent more or less violent audible signal to stir the sleeper into activity should he not hear or ignore the preliminary or gentle signal.

The aim of the invention is to provide an alarm mechanism of this sort having various features of novelty and advantage and which is particularly characterized by its low cost of manufacture, its simplicity in construction, and its reliability in operation.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawings, wherein is shown, for illustrative purposes, one embodiment which the present invention may take:

Figure 1 is a rear view of the clock mechanism;

Fig. 2 is a view looking at the front end of the alarm mechanism;

Fig. 3 is a side view of what is shown in Fig. 1; and

Fig. 4 is a diagrammatic view showing the various elements of the alarm mechanism in extended condition.

Referring to the drawings in detail, the clock may have the usual front frame or plate 10, a back upper plate 11, and a back lower plate 12 spaced rearwardly of the plate 11, the plates being held in spaced relation by the usual pillars 13.

The plates carry the usual time train of gears which may be of any suitable construction and arrangement and, therefore, is not shown in detail. This time train may be driven by a time main spring 14 and may have the usual center or minute arbor 15 and an hour wheel 16 driven from the shaft 15 through a minute wheel 17.

The letter B designates a bell (shown in broken lines, Fig. 3) which, when struck, will give an audible signal and, associated with this bell, are two hammers 20 and 21, the former of which is actuated with a relatively slow movement so as to give a more or less preliminary gentle audible signal and the latter of which is actuated with a fast movement or beat so as to give a more violent signal after the hammer 20 has given its initial signal. The hammer 20 is carried by a resilient arm 22 extending from a rock shaft 23 which is journalled in the plates 10 and 11 and which has a projecting finger 24 adapted to engage a pillar 13 in order to limit movement of the hammer 20 towards the bell. A spring 25 coiled about the rock shaft 23 and having its opposite ends connected to the finger 24 and the pillar 13, respectively, is provided for resiliently urging the hammer 20 towards the bell. The fast alarm hammer 21 is carried by a depending arm 26 projecting from a rock shaft 27 journalled in the plates 10 and 11 and having a limited axial movement relative to those plates for a purpose hereinafter described more in detail. The hammer 20 is operated by an actuating wheel 28 having ratchet teeth 29 with which cooperates a rod 30 projecting radially from the rock shaft 23. The fast hammer 21 is operated by a crown or escapement wheel 31 with which cooperates an alarm verge 32 fixed to the rock shaft 27.

The hammer actuating members 28 and 31 are driven through an alarm train by a single source of power, such, for example, as an alarm main spring 35, one end of which is fixed in the usual manner to an alarm wind arbor 36 journalled in the plates 10 and 11. Loose upon the alarm wind arbor is a main wheel 37 and fixed to the arbor is a ratchet wheel 38 cooperating with a spring pressed pawl 39 carried by the main wheel 37. With this arrangement, the alarm main spring may be wound up by turning the arbor in one direction without turning the main wheel, and the main wheel will rotate with the arbor when the latter is driven in the opposite direction by the main spring. In like manner, the hammer actuating wheel 28 is associated with the arbor 36 by a ratchet wheel 40 and a spring pressed pawl 41. In order to control the speed at which the alarm train is driven by the spring 36, the usual air fly 42 is provided, the same being carried by a shaft 43 journalled in the back plates 11 and 12. The fly shaft 43 is driven from the main wheel 37 through a lantern pinion 44, wheel 45, lantern pinion 46, shaft 47, and the cooperating wheels and pinions 48—49, 50—51, and 52—53. The shaft 47, which is rotated at a faster speed than the wind arbor 36, carries the crown or escapement wheel 31 for actuating the fast hammer 21.

Any suitable settable means operatively connected to the time movement may be employed for controlling the operation of the alarm train in order that the alarm may be given at any desired time. By way of example, the means is here shown as comprising an alarm cam 60 and a set-

table cam finger 61 cooperating with the cam. The cam 60 is fixed to a wheel 62 meshing with the minute wheel 17 so that the cam will make one revolution during every twelve hours, for example. The cam has the usual helical cam edge provided with a notch 63 in which the finger 61 is adapted to engage after the high point of the cam rides from under the finger. This finger 61 is staked to the forward end of the usual alarm set shaft 64, the extreme forward end of which may be provided with an indicating hand (not shown). The unit comprising the cam 60 and the wheel 62 is slidably mounted on the forward end of the set shaft 64 and is normally urged forwardly towards the finger 61 by a resilient control lever 65 which is here shown as being in the form of a spring strip, one end of which is fixed to the front plate, as at 66, and the free end of which is bent rearwardly, as at 67. The end 67 of the control lever is adapted to cooperate with a suitable stop finger 68 on the arbor or shaft 47 for preventing rotation of the alarm train.

As previously stated, the rock shaft 27, which carries the fast hammer and the alarm verge 32, is mounted for axial movement, the purpose of such movement being to permit the verge to be moved into and out of operative relation to the crown or escapement wheel 31. In order to so move the rock shaft, there is provided, rearwardly of the back plate 11, a cam wheel 75 having an arcuate slot 76 in which is adapted to engage a tapered stud 77 carried by a spring 78, one end of which is fixed to the back plate 11, as at 79. The other end of this spring is forked to provide a pair of arms 80 which engage in the groove of a collar 81 fixed to the rock shaft 27. When the stud 77 is engaged in the arcuate slot 76, the spring 78 urges the rock shaft 27 forwardly so as to engage the verge with the escapement wheel 31. When the stud engages the unslotted portion of the cam wheel 75 which is between the ends of the slot, the rock shaft is held in a rearward position in which the verge is out of operative relation to the escapement wheel. The cam wheel 75 has gear teeth 75' on its periphery which mesh with a pinion 82 fixed to a wheel or gear 83 which meshes with a small pinion 84 fixed to the alarm wind shaft 36. The periphery of the cam wheel 75 has a blank or untoothed portion 75'' which acts as a stop for limiting the extent of rotary movement of the cam wheel.

The operation of the mechanism is briefly as follows: To wind up the alarm main spring, the winding shaft is turned counterclockwise, reference being had to Fig. 1, and, when so turned, the cam wheel 75 will be turned counterclockwise until the blank portion 75'' of the cam wheel engages the teeth of the small pinion 82. At this time, the main spring is fully wound up and the stud 77 engages the unslotted portion of the cam wheel so that the verge is held rearwardly out of operative relation to the escapement wheel 31. The alarm set lever may be turned so as to set the alarm in the usual manner. It is, of course, understood that the rearwardly turned end of the control lever 65 will be in the path of the stop finger 68 and thus prevent turning of the alarm train so long as the set finger 61 is not in the notch 63 of the cam 60. When the time arrives for the alarm to go off, the cam 60 will have turned to the position where the finger 61 may engage in the notch 63, whereupon the end 67 of the control lever 65 is free to move forwardly out of engaging position with the stop finger 68 and that finger now being released, the alarm train will be driven by the main spring 35. This means that the shaft 36 is rotated with the hammer actuating wheel 28 so that the teeth 29 of that wheel will cause the hammer 20 to tap the bell, the intervals between the taps being relatively long. Thus, a gentle or warning signal is given to the sleeper without unduly startling him. When the arbor 36 is turned, the cam wheel 75 for the fast alarm is also turned but, for an appreciable period of time, the stud 77 will be in engagement with the unslotted portion of the cam wheel, thus allowing the gentle signal to sound for some time before the fast alarm comes into play. When the cam wheel has been turned to such an angle that the slot therein registers with the stud 77, this stud will move into the slot and, therefore, the spring arm 78 will push the rock shaft 27 forwardly thereby bringing the verge 32 into operative relation with the teeth on the escapement or crown wheel 31. These teeth will now rock the verge with a rapid or vibrating movement, thereby causing the hammer 21, which has also been moved into operative relation to the bell, to strike the bell quite rapidly and thus give a more or less violent signal which the sleeper will be unable to ignore. The alarm may be manually shut off by pressing downwardly on a shut-off rod 90 having a depending finger 91 adapted to lie in the path of rotation of the air fly. This shut-off rod may be mounted for sliding movement in any suitable manner as, for example, by means of screws 92 extending loosely through elongated slots in the rod. When the alarm spring is again wound up, the cam wheel 75 is turned to the position shown in Fig. 1 so that, on the next operation of the alarm, the slow hammer will first be operated and then the fast hammer, as just described.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim as my invention:

1. In an alarm clock, a hammer for giving a gentle audible signal, actuating means for imparting a slow beat to said hammer, a second hammer for giving a more disturbing signal, actuating means for imparting a fast beat to said second hammer, driving means common to both of said hammer actuating means, said second mentioned actuating means including an actuating part and an actuated part relatively movable into and out of operative relation, and means driven in timed relation to said first mentioned actuating means for controlling said second actuating means.

2. In an alarm clock, a hammer for giving a gentle audible signal, actuating means for imparting a slow beat to said hammer, a second hammer for giving a more disturbing signal, actuating means for imparting a fast beat to said second hammer and including a part movable into and out of operative position, a spring normally urging said part into operative position, a cam driven in timed relation to said first mentioned

actuating means and having an arcuate slot, and a stud on said spring adapted to engage in said slot, said spring when the stud is engaged in said slot maintaining said part in operative position and the unslotted portion of said cam being employed to hold said part in inoperative position.

3. In an alarm clock, a hammer for giving a gentle audible signal, actuating means for imparting a slow beat to said hammer, a second hammer for giving a more disturbing signal, actuating means for imparting a fast beat to said second hammer and including a toothed wheel and a verge cooperating therewith, driving means for said first actuating means and said toothed wheel, an axially movable rock shaft carrying said verge and said second mentioned hammer, a spring normally urging said shaft to a position where said verge is engaged with said toothed wheel, and a cam for moving said verge into inoperative position with respect to said toothed wheel.

CHRISTIAN JAUCH.