

W. J. BANISH & J. C. SWARTHOUT.

TIME CLOCK.

APPLICATION FILED MAR. 1, 1911.

1,042,867.

Patented Oct. 29, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

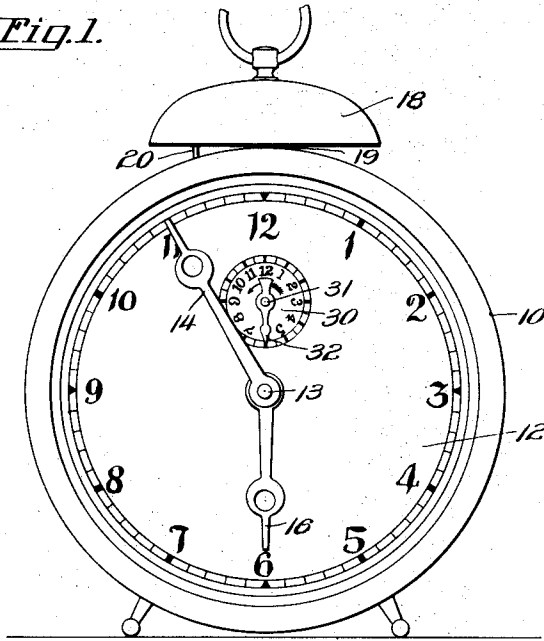


Fig. 8.

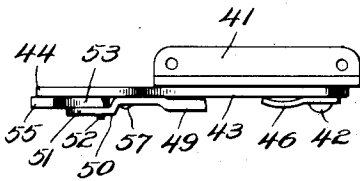
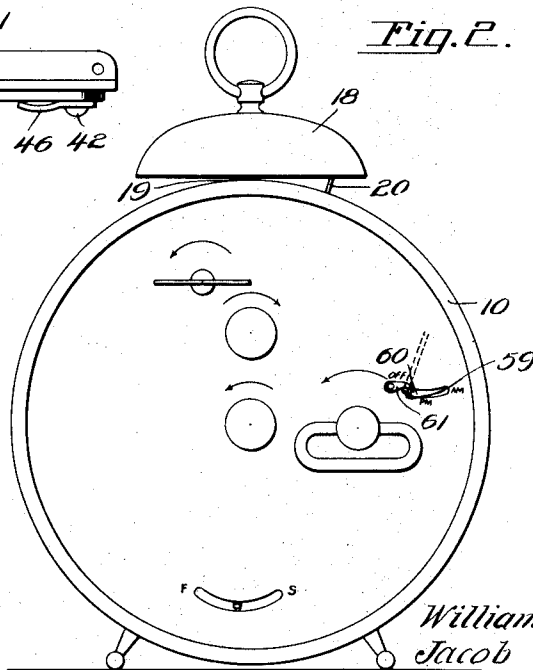


Fig. 2.



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2 SHEETS-SHEET 2

Fig. 3.

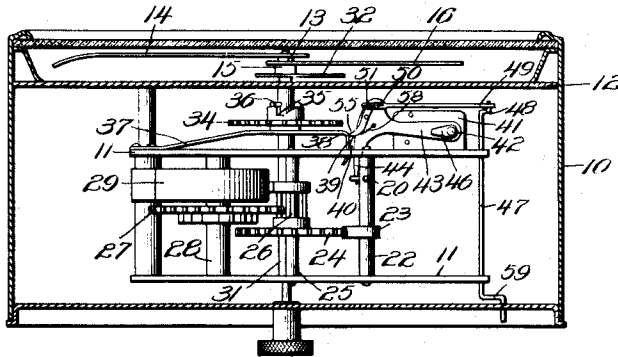


Fig. 4.

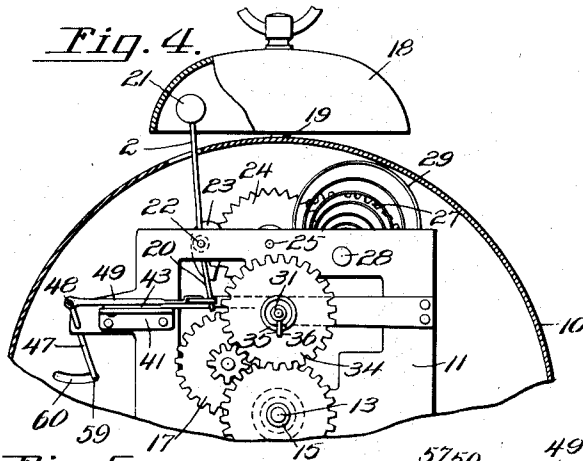


Fig. 5.

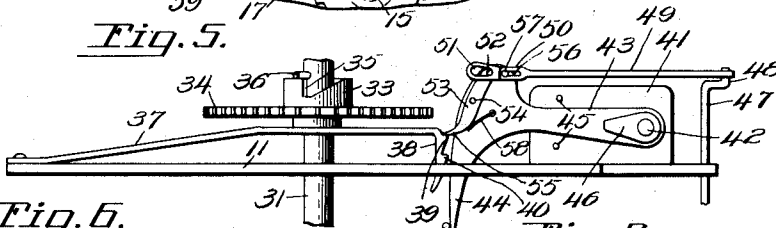


Fig. 6.

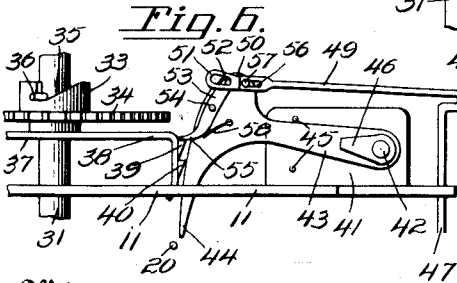
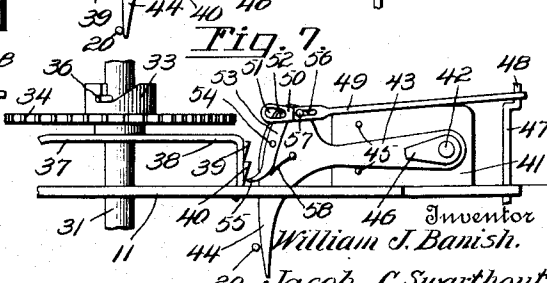


Fig. 7.



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UNITED STATES PATENT OFFICE.

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TIME-CLOCK.

1,042,867.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed March 1, 1911. Serial No. 611,569.

To all whom it may concern:

Be it known that we, WILLIAM J. BANISH and JACOB C. SWARTHOUT, citizens of the United States, residing at Valley City, in the county of Barnes and State of North Dakota, have invented new and useful Improvements in Time-Clocks, of which the following is a specification.

The invention relates to alarm clocks, and more particularly to the class of alarm controlling mechanism for time clocks.

The primary object of the invention is the provision of mechanism of this character in which an alarm in a clock may be automatically sounded at a predetermined period of time either every twelve or twenty-four hours, so that should it be desired to sound the alarm every twenty-four hours, there will be no possibility of sounding the alarm at the same determined time within twelve hours space thereof, thus the alarm is susceptible of being sounded at any predetermined hour periodically at the lapse of twelve or twenty-four hours, but will not sound at a less space of time unless the mechanism is manually set for this time.

Another object of the invention is the provision of an alarm controlling mechanism which may be set within a space of time approximate the determined hour at which the alarm is to be sounded, without causing the sounding of the latter at the time of setting such mechanism.

A further object of the invention is the provision of mechanism of this character which is simple of construction, readily and easily mounted on alarm clocks of any well-known construction, and which is thoroughly reliable and efficient in operation, and inexpensive in manufacture.

In the drawings, accompanying and forming a part of this specification is illustrated the preferred form of embodiment of the invention, which to enable those skilled in the art to carry the invention into practice, will be set forth at length in the following detail description, while the novelty of the invention will be pointed out in the claims hereunto appended.

In the drawings: Figure 1 is a front elevation of an alarm clock of the ordinary well-known construction, showing the invention applied thereto. Fig. 2 is a rear elevation. Fig. 3 is a top plan view showing the casing in horizontal section. Fig. 4 is a fragmentary vertical sectional view through

the casing showing the mechanism in side elevation. Fig. 5 is a fragmentary top plan view of the alarm mechanism when in one position. Fig. 6 is a similar view showing the mechanism in another position. Fig. 7 is a similar view showing the mechanism in still another position. Fig. 8 is an edge view of the trip catch and its adjunct parts.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings by numerals, 10 designates generally the casing of the clock which is of the ordinary well-known construction and shape, and in which is suitably mounted the works or clock movement supporting frame 11, supporting at its front a dial 12, on which are numerically arranged figures ranging from 1 to 12, designating the individual hour ratio, covering a lapse of twelve consecutive hours of time, the dial being further marked to indicate fractions less than an hour in the ordinary well-known manner. Journaled centrally in the frame 11 and projecting centrally through the dial 12 is an arbor 13, which is adapted to turn every hour, and to which is fixed a minute hand 14. Surrounding the arbor 13 is a sleeve 15, to which is fixed the hour hand 16, the said arbor 13 and sleeve 15 being rotated by means of a train of clock gears 17, which are controlled through the medium of a main spring (not shown), the train of gears being arranged in a manner as is customary in the usual time clocks.

Mounted upon the casing is a gong or bell 18, the same being supported by a staff or standard 19, rising from the said casing and suitably fixed thereto. The casing is provided with a suitable slot, through which passes the vibratory striker arm 20 having a ball clapper 21 at one end thereof, the arm being fixed intermediate its length to an oscillatory spindle 22, the same being journaled in the frame 11 and carrying the usual anchor 23 operated upon by means of a ratchet wheel 24 fixed to a spindle 25 journaled in the said movement frame 11. Also fixed to this spindle 25 is a pinion 26 meshing with the gear 27 supported upon a winding shaft 28 journaled in the frame 11, and to which is connected the main spring 29 of the alarm movement mechanism.

Provided on the clock dial 12 is an alarm setting dial 30 which is divided off into equal portions or divisions, each division

being regularly spaced and designated by numerals ranging from 1 to 12 to indicate the hours of the day, or night. Also this dial 30 has further sub-divisions indicating fractions of each hour.

5 Journaled in the frame 11 is an alarm setting arbor or shaft 31, the same being projected centrally through the dial 30 and has fixed thereto a pointer 32, the latter being adapted to traverse the divisions and subdivisions upon the dial 30 for the setting of the alarm, whereby the same may be sounded in a manner, as will be hereinafter more fully described.

15 Loosely mounted upon the shaft 31 is the hub 33 of a gear 34, the same being intermeshed with the train of gears 17 of the clock movement, one end of the hub 33 being formed with a cam 35 engaging a pin 36 fixed in the shaft 31 and projecting outwardly therefrom at right angles thereto. The opposite end of the hub 33 is frictionally engaged with a bowed leaf spring 37 having one end fixed to the frame 11, while its opposite end is returned to provide a tongue 38, the same being formed with projecting teeth 39 and 40, respectively, for cooperation with the "A. M." and "P. M." alarm controlling mechanism, as will be hereinafter more fully described.

30 Integral with or mounted upon the front wall of the frame 11 and projecting therefrom in a horizontal plane or at right angles thereto, is a bearing 41 having connected thereto, by means of a pivot 42, a swinging trip catch or pawl 43, the latter being provided with an elongated nose 44 adapted to be projected into and out of the path of movement of the free end of the vibratory striker arm 20, the trip catch or pawl 43 being limited in its movement by means of stop pins 45 fixed in and rising from the bearing 41 in spaced relation to each other.

45 Fixed to the pivot 42 and acting upon the trip catch or pawl 43 is a spring member 46 the latter being designed to frictionally hold the said catch or pawl 43 to prevent free movement thereof and to maintain it in adjusted position as will be herein after more fully described.

50 Rotatably journaled in suitable bearings in the frame 11 of the clock movement, is an adjusting shaft 47, the same being formed at one end with a crank 48, the latter loosely connected to a link or throw rod 49 which is provided with an offset extremity 50, containing an elongated slot 51, in which is engaged a lug 52 mounted upon a dog 53, the same being connected to the catch or pawl 43 by means of a pivot 54 which is engaged with the dog 53 medially thereof. This dog 53 is provided with a laterally curved lip 55 adapted for engagement with the teeth 39 and 40 on the spring 37, where- by the latter will be locked with the trip

catch or pawl 43 when the said spring has been moved inwardly on the turning of the gear 34, the spring 37 being displaced by the cam 35 of the hub 33 of the gear, when working against the pin 36 upon the setting arbor or shaft 31, as the said hub 33 rotates with the gear 34 operated by the train of gears 17 of the clock movement. In link or throw rod 49, rearwardly of the offset 50, is provided with a further slot 56, in which is engaged a lug 57, the latter being fixed in the trip catch or pawl 43, the said lug being disposed at one end of the slot 56 in the rod 49 when the dog 53 is in position for engagement with the teeth 39 and 40 on the spring 37. Fixed to the trip catch or pawl 43 is a spring 58, the free end of which is adapted to act upon the dog 53, so that when the latter is in position for engagement with the spring 37, the lug 52 on the dog will rest against the inner end of the slot 51 in the throw rod 49, thereby permitting the dog 53 to trip over the teeth 39 and 40 on the spring 37 when the same is being moved in one direction, so that the said dog by the action of the spring 58 will automatically become locked with the spring, for a purpose as will be hereinafter more fully described.

9. The adjusting shaft 47 at its outer end is provided with a crank 59 serving as a handle for regulating the alarm controlling mechanism. The hand crank 59 is protruded through an arcuate-shaped slot 60 formed in the back of the casing 10 which has marked thereon contiguous to one end of the said slot 60 the letters "A. M." while at the point intermediate the ends of the said slot are marked the letters "P. M.", and also at the opposite end of the slot is marked the word "Off". Pivoted to the back of the casing 10 at the end of the slot marked "Off" is a catch 61 which can be manually thrown into engagement with the crank 59 for holding it in position at "Off" and in this manner the alarm mechanism can be sustained inactive, thus, preventing the sounding of the alarm during the working of the clock.

115 The manner of operation of the alarm controlling mechanism is as follows: Should it be desired to set the said mechanism so that the alarm will sound at a predetermined hour a. m., it is only necessary for a person to rotate the setting shaft 31 in the ordinary well known manner, whereby the pointer 32 will indicate such designated hour on the face of the dial 30 and thereafter the adjusting shaft 47 is shifted by the crank handle 59 it being understood that the latter has been released by the catch 61 so that it can be thrown in the slot 60 at a. m., thus, the throw rod 49 will be simultaneously moved with the shaft 47 causing the nose 44 of the catch or pawl 43 130

to be thrown into the path of movement of the striker arm 20, thereby holding the same passive until the said pawl 43 is retracted by the tooth tongue 38 on the displacement of the spring 37 in a manner presently described.

The spring 37 is moved inwardly on the turning of the shaft 31 by reason of the cam becoming displaced thereon when the pin or lug 36 rides over the same. The pin 36 is carried by the shaft 31 but the set spring 37 is not moved inwardly a sufficient distance so that the tooth 40 on the nose 38 will engage with the dog 53, thereby preventing the throwing of the pawl 43 out of the path of the striker arm 20 until the predetermined hour set for the sounding of the alarm. During the working of the clock the gear 34 is rotated as usual and simultaneously the cam 33 is moved therewith. Now by reason of the contact of the pin 36 with the cam 33 the gear is longitudinally displaced on the shaft 31, thereby moving inwardly the spring 37 which causes the engagement of the tooth 40 with the dog 53 and on the notch 35 in the cam 33 alining with the pin 36 the said cam will be moved and the spring 37, which has as heretofore stated become retracted, now springs outwardly, and by the engagement of the tooth 40 with the dog 53 moves with it the pawl 43 so that the nose 44 will be shifted out of the path of the striker arm 20, allowing the alarm to be sounded at the predetermined hour a. m.

Assuming that it is desired to have the alarm sound at a predetermined hour p. m., the crank 59 is shifted in the slot 60 to the p. m. mark and in this manner the pawl 43 is thrown inwardly into the path of the striker arm 20, it being understood of course that the alarm shaft 31 has been adjusted so that the pointer 32 will be set at the designated hour on the face of the dial 30 for the sounding of the alarm at the proper hour, the nose 44 of the pawl 43 being projected sufficiently far across the path of movement of the striker arm 20 so that when the cam 33 is tripped on the pin 36 during the first revolution of the cam the tooth 40 will engage the dog 53 and move the pawl 43 a limited distance, but will not cause it to be moved sufficiently far so that the nose 43 will be thrown out of the path of movement of the striker arm 20, thereby preventing the sounding of the alarm on the designated hour at a. m. However, on the second revolution of the cam 33 the tooth 38 is brought into engagement with the pawl 53 and when the said cam is again tripped by the pin 36 on the shaft 31 the spring 37 will further move the pawl 43 so that its nose will be shifted out of the path of movement of the striker arm 20, thereby freeing the same for the sounding of the alarm at the designated hour at p. m.

When the crank 59 has been shifted in the slot 60 to "Off" and the catch 61 is engaged therewith, the pawl 43 is moved so that its nose 44 will be thrown into the path of movement of the striker arm 20 and also the dog 53 will be shifted out of the path of the teeth 39 and 40 on the intumed end of the spring 37, thus, preventing the operation of the alarm controlling mechanism, and the sounding of the alarm on any hour at a. m. or p. m.

It is understood that the friction member 46 upon the pawl 43 will sustain the same in its adjusted position when shifted by the hand crank 59, the dog 53 being mounted to permit the teeth 39 and 40 to pass the same when the intumed end of the spring 37 is moved in one direction.

What is claimed is:

1. In an alarm clock, the combination with a twelve hour alarm mechanism, of an alarm controlling mechanism comprising a swinging member mounted to move into and out of the path of the striker of the alarm mechanism, a catch device carried by said member and means coöperative with the alarm mechanism and adapted to be engaged by said catch device and manually operated means for adjusting the position of the said member whereby the alarm mechanism will either move the same once or twice for retracting it from the path of the striker of the alarm mechanism.

2. In an alarm clock, the combination with a twelve hour alarm mechanism, of an alarm controlling mechanism comprising a swinging member mounted to move into and out of the path of the striker of the alarm mechanism, a catch device carried by said member and means coöperative with the alarm mechanism and adapted to be engaged by said catch device, manually operated means for adjusting the position of the said member whereby the alarm mechanism will either move the same once or twice for retracting it from the path of the striker of the alarm mechanism, and means for locking the said alarm controlling mechanism against action and disengaged from the alarm mechanism.

3. In an alarm clock, the combination with a twelve hour alarm mechanism by which the alarm is set and released at a predetermined time, of alarm controlling mechanism comprising a step by step movable means adapted to be thrown into position for preventing the sounding of the alarm, means coöperative with the alarm mechanism for engagement with said step by step movable means for shifting the same to permit the sounding of the alarm, and means acting upon the first named means to shift the same into position whereby it may be moved a single or two steps by the second named means.

4. In an alarm clock, the combination with a twelve hour alarm mechanism by which the alarm is set and released at a predetermined time, of alarm controlling mechanism comprising a step by step movable means adapted to be thrown into position for preventing the sounding of the alarm, means coöperative with the alarm mechanism for engagement with said step by step movable means for shifting the same to permit the sounding of the alarm, means acting upon the first named means to shift the same into position whereby it may be moved a single or two steps by the second named means, and means for locking said first named means against movement.

5. In an alarm clock, the combination with a twelve hour alarm mechanism having a striker arm, of a swinging pawl pivotally mounted in the clock and movable into and out of the path of the striker arm, a locking dog pivoted to said pawl, means coöperative with the alarm mechanism for engagement with the dog whereby the said pawl may be automatically shifted out of the path of the striker arm, and means for setting the said pawl whereby it may be

moved by said first named means for releasing the striker arm once in either twelve or twenty-four hours.

6. In an alarm clock, the combination with a twelve hour alarm mechanism having a striker arm, of a swinging pawl pivotally mounted in the clock and movable into and out of the path of the striker arm, a locking dog pivoted to said pawl, means coöperative with the alarm mechanism for engagement with the dog whereby the said pawl may be automatically shifted out of the path of the striker arm, means for setting the said pawl whereby it may be moved by said first named means for releasing the striker arm once in either twelve or twenty-four hours, and means for locking the pawl in the path of movement of the striker arm for preventing the sounding of the alarm.

In testimony whereof we affix our signatures in presence of two witnesses.

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JACOB C. SWARTHOUT.

Witnesses:

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JAMES W. NIELSON.