(Model.) 2 Sheets—Sheet 1.

G. H. BLAKESLEY.

REPEATING MECHANISM FOR CLOCKS.

No. 457,024. Patented Aug. 4, 1891.

Fig. 1.

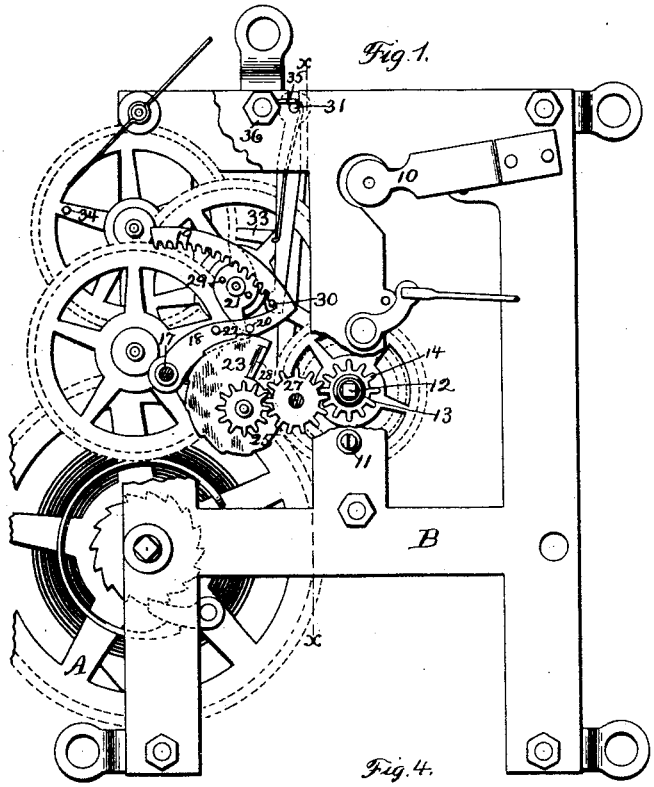


Fig. 2.

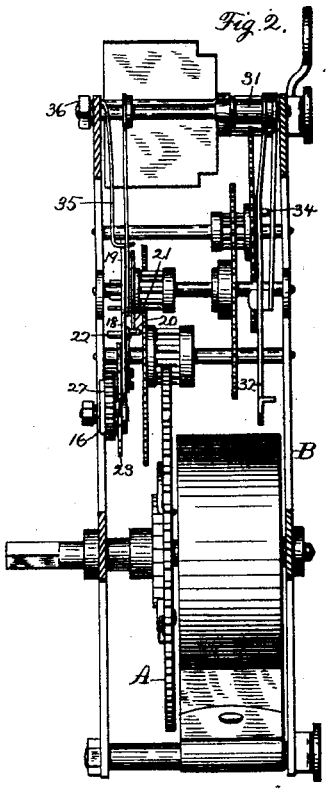


Fig. 4.

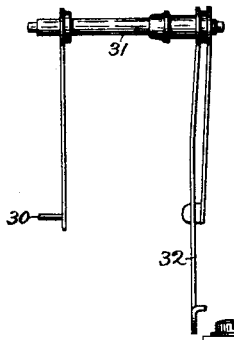


Fig. 3.

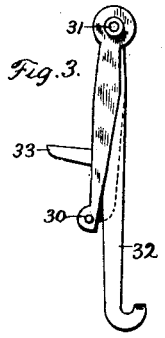
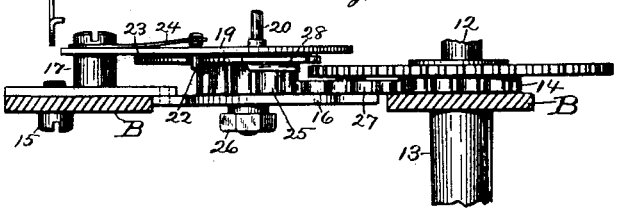


Fig. 5.



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(Model.) 2 Sheets—Sheet 2.

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REPEATING MECHANISM FOR CLOCKS.

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Fig. 6.

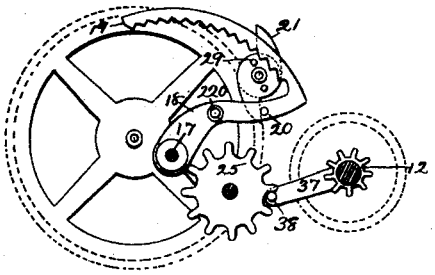


Fig. 7.

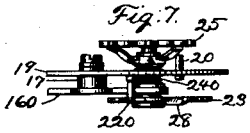


Fig. 8.

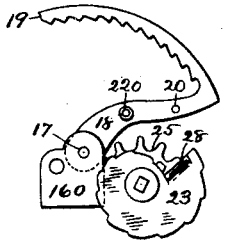
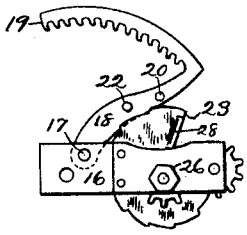


Fig. 9.



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UNITED STATES PATENT OFFICE.

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REPEATING MECHANISM FOR CLOCKS.

SPECIFICATION forming part of Letters Patent No. 457,024, dated August 4, 1891.

Application filed August 1, 1890. Serial No. 360,684. (Model.)

To all whom it may concern:

Be it known that I, GILBERT H. BLAKESLEY, a citizen of the United States, residing at Bristol, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Clock Striking Mechanisms, of which the following is a specification.

My invention relates to improvements in clock striking mechanisms; and the objects of my improvement are to provide simple and efficient means for arranging the rack and snail by the side of the pendulum and escapement, so that all are on the front of the clock; to make a rack-and-snail attachment that is applicable to the train of an ordinary striking-clock, and in general to improve the construction especially with reference to the manner of assembling the parts.

In the accompanying drawings, Figure 1 is a front elevation of the principal parts of the striking mechanism, together with enough of the time parts to show its connection therewith. Fig. 2 is a side elevation of such parts of the same as are located upon the left-hand side of the line *x x* of Fig. 1, the frame of the clock-movement being shown in section on said line. Fig. 3 is a detached front elevation of the let-off lever and lifting-hook. Fig. 4 is a side elevation of the same. Fig. 5 is an enlarged detached horizontal section of the rack, the snail, and its connection with the socket on the center shaft. Fig. 6 is a front elevation of detached parts, showing the rack, the snail-pinion, and its connection with the center shaft in a different form, said center shaft and shafts or studs on which the rack and snail-pinion are hung being shown in vertical section. Fig. 7 is a detached plan view of the rack, snail, snail-pinion, and plate by which the same are attached to the movement-plate in said different form. Fig. 8 is a front elevation of the same, and Fig. 9 is a detached front elevation of the rack-and-snail plate and connected parts in the form illustrated on Sheet 1.

The main wheel A and connected train of gears are the same as heretofore employed for a lock-work strike. The frame in which these parts are mounted is also of the ordinary construction, and the time side of the frame will be filled with an ordinary time-movement having the escapement-wheel mounted at the front under the bridge 10 and the pendulum hung on the stud 11 immediately under the center shaft 12, all substantially as in the ordinary clocks having a lock-work strike.

Part of the front plate in Fig. 1 is broken away, in order to show the other parts. I place the usual socket 13 upon the center shaft, the same being driven in the ordinary manner, so as to revolve once in twelve hours. At the base of this socket in one form of my device I form or attach a pinion 14, containing twelve teeth.

To the front movement-plate B, I attach, by means of a screw 15, Fig. 5, the rack-and-snail plate 16, said plate having pivoted to its back side on the stud or shaft 17 the rack 18, having teeth formed at the inner edge of its rack-bar 19. The rack is provided on its rear side with a pin 20 for being engaged by the dog 21 when the rack is lifted, and with a pin 22, projecting at the front through a hole in the body of said rack, for engaging the edge of the snail 23 in the ordinary manner of rack-and-snail strikes. This hole is laid out accurately with reference to the fulcrum of the rack and the steps of the snail, so that the sliding pin passing through said hole, as it falls on the edge of the snail, will be dropped the proper distance to correctly strike the hour, whereby said hole serves as a gage for said sliding pin. I have illustrated this pin as sliding through the rack and held in place by the spring 24, as shown in Fig. 5, so that it may yield under certain circumstances hereinafter described. The snail 23 and the twelve-toothed pinion 25, concentric therewith and rigidly connected, are also mounted on the plate 16, the shaft by which they are attached and which revolves with them being held in place by the nut 26. An intermediate pinion 27 is also connected to the rack-and-snail plate 16, so that when said plate is in place, as shown in Figs. 1 and 5, the intermediate gear engages the pinion 14 on the center shaft 12, thereby revolving the snail once in twelve hours, while it is located to one side of the center shaft, so as to permit of the rack and snail being used in connection with a pendulum and escapement on the front side of the clock. The radial edge of

the snail between the bearings or steps for striking the hours twelve and one is bent forwardly, so as to form a bevel or cam 28, whereby when the snail is turned forwardly said cam may engage the end of the pin 22 and slide it backwardly out of the way of the snail, the spring 24 permitting this to be done and returning the pin again to its normal position.

As shown and described, the shaft which carries the dog 21 is provided with two pins 29 for engaging the teeth of the rack and lifting it one tooth as each pin passes by the same, and therefore the dog 21 is provided with two arms for arresting the motion of this shaft when the rack is fully elevated, as the one arm stops said shaft in the ordinary rack-and-snail strike. It is of course evident that if there were only one of said gathering-pins the dog would be provided with only one arm instead of two.

I hang the lifting or retaining hook 30 on a shaft 31 at the upper part of the clock, and upon the same shaft I hang the compound lifting or letting-off lever 32, the same being provided with an arm 33 for engaging the ordinary warning-pin 34. In order to enable this shaft 31 and connected parts to be attached after the other parts have been assembled within the frame, I slot the upper edge of the front movement-plate B, as shown in Fig. 1, so that after inserting the rear end of said shaft its front end can be brought to its proper bearing by slipping it into said slot. The spring 35 for actuating the lifting or holding hook 30 is then placed in proper position with its shank resting on the top of the shaft in said slot and wound about the adjacent movement-post and held in position by screwing down the nut 36 at the outer end of said post.

From the foregoing it will be seen that the ordinary clock provided with a dog 21 and pinion 14 may be put together, and the rack, snail, and remaining parts to form a complete strike may be attached thereto after the main parts have been assembled. In thus putting the parts together the snail might not be in position for striking the proper hour, in which case its shaft may be loosened by unscrewing the nut 26 to let its pinion slip back out of gear with the intermediate pinion 27 and the snail revolved to the proper point and then slipped into gear and secured as before.

In Figs. 6, 7, and 8 I have illustrated a different form of my improvement, which differs from that first described in the details of connecting the twelve-hour pinion with the center-shaft and in the details of the mechanism for avoiding the deadlock in turning the pointers by hand. In some particulars it is the preferred form of my improvement. 12 designates the center shaft, to which I connect a rigid arm 37, having a pin 38 for engaging once an hour the twelve-toothed pinion 25 of the snail 23. This pinion and snail are hung on the same shaft, so as to rotate together; but the shaft is permitted to have a sliding movement in the rack-and-snail plate 160, and a spring 240 is coiled about said shaft to hold the rack and snail in their normal position. The pin 220 for engaging the edge of the snail is rigidly fixed in the body of the rack, and the rack is hung to the rack-and-snail plate 160 on the stud 17, as in the construction first described. When the snail is turned forwardly by hand, its cam 28 engages the pin 220, and the snail itself slips forward, (instead of the pin slipping backwardly,) so as to pass said pin, after which the spring 240 restores the parts to their normal position. From this description it will be seen that a twelve-toothed wheel rigidly connected with the snail with twelve steps for striking the twelve hours may be driven either by a continuously-moving twelve-toothed wheel revolving once in twelve hours, or by a rigid arm revolving once an hour; and it is not seen how a wheel with any other number of teeth can be the equivalent for both of said uses.

By arranging the rack-bar 19 with teeth at its inner edge in connection with the parts as shown, I am enabled to locate the rack to one side of the center shaft and pivot it to the attachable and detachable plate in the manner described. In some cases, however, I may wish to employ a rack-bar with teeth at the outer edge, and therefore do not wish to limit all features of my invention to a clock-strike which employs a rack with teeth at the inner edge.

I have not illustrated the hammer-wire and its connection with the striking-train, inasmuch as there is nothing therein which is peculiar to my invention; but it will of course be understood that the movement is to be provided with a hammer, which may be of any ordinary construction.

I claim as my invention—

1. In a rack-and-snail striking-clock, the combination of the twelve-toothed wheel or pinion, and the hour-snail having steps for twelve hours revolving together on the same axis, and a rigid arm revolving once an hour by the side of said twelve-toothed wheel for driving it and said snail, substantially as described, and for the purpose specified.

2. The frame, spring, and train of the strike side of a clock, in combination with a rack-and-snail plate 16, attachable and detachable to and from the front plate of said frame, and a snail and twelve-toothed wheel rigidly mounted to revolve together on said rack-and-snail plate, substantially as described, and for the purpose specified.

3. The combination of the frame, spring, and gearing of the striking side of a clock, the snail and twelve-toothed wheel revolving together on an axis at one side of the center shaft, the rack having the pin 22 on its body, and the rack-bar with teeth on its inside edge, the gathering-pin and retaining-hook both

arranged within the circle on which said rack oscillates, substantially as described, and for the purpose specified.

4. The combination of striking-train and its frame, an inclosed bearing in the rear plate of said frame, a slotted bearing in the front plate of said frame by the side of one of its posts, the attachable and detachable shaft 31, fitted to said bearings and having connected lock-work, the spring 35 for pressing said lock-work in one direction, and a nut on the post near said slotted bearing for securing said spring and shaft in place, substantially as described, and for the purpose specified.

5. In a rack-and-snail clock, the attachable and detachable rack-and-snail plate, the snail provided with the cam or incline 28, the twelve-toothed wheel mounted on said plate in connection with said snail to revolve together, the rack also mounted upon said plate, and a pin for resting upon the edge of said snail, said snail and pin being mounted with a relatively sliding movement and provided with a spring for holding them in position, substantially as described, and for the purpose specified.

6. The combination of a striking-train and its frame with the attachable and detachable rack-and-snail plate, the snail and twelve-toothed pinion rigidly connected to revolve together and both mounted on said plate, and the rack also mounted on said plate, all substantially as described, and for the purpose specified.

7. The combination of a movement-frame, the driving-spring and train of the strike side of a clock, one of the shafts of which is provided with a gathering-pin and stop-dog, the compound lifting or letting-off lever 32, the retaining-hook 30, and the rack-and-snail plate having mounted thereon the rack, the snail, and its driving-wheel and made attachable to and detachable from the front plate of said frame, substantially as described, and for the purpose specified.

8. The combination of a movement-frame, the driving-spring and train of the strike side of a clock, one of the shafts of which is provided with a gathering-pin and stop-dog, the shaft 31, having the compound lifting or letting-off lever 32, made attachable and detachable to and from said frame when it is intact, and the rack-and-snail plate having the rack, the snail, and its driving-wheel mounted thereon and made attachable to and detachable from the front plate of said main frame, substantially as described, and for the purpose specified.

9. In a rack-and-snail striking-clock, the combination of the snail having twelve steps for the twelve hours, a rack definitely located with reference to said snail and having a hole for the pin that engages the edge of said snail made in its rigid body in contradistinction to a yielding or adjustable arm, said hole serving as a gage for determining the relations of said rack and snail and operating mechanism, substantially as described, and for the purpose specified.

10. The combination of a frame, mainspring, and train of the striking part of a clock, the rack and snail, the shaft 31, and attached lock-work made attachable to and detachable from said frame when intact, a spring for forcing said lock-work in one direction, and mechanism for actuating said snail and lock-work, substantially as described, and for the purpose specified.

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