(Model.)

E. DAVIES.

ALARM CLOCK.

No. 304,080. Patented Aug. 26, 1884.

Fig. 1.

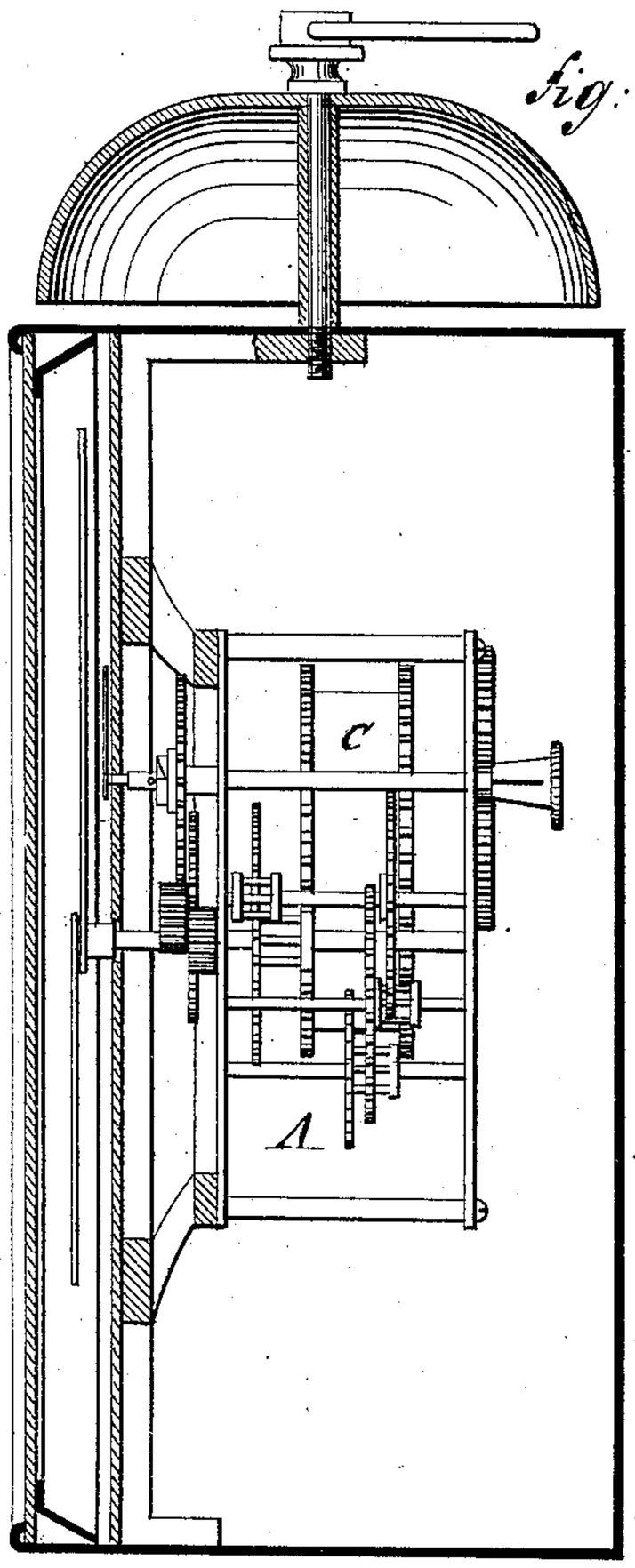


Fig. 2.

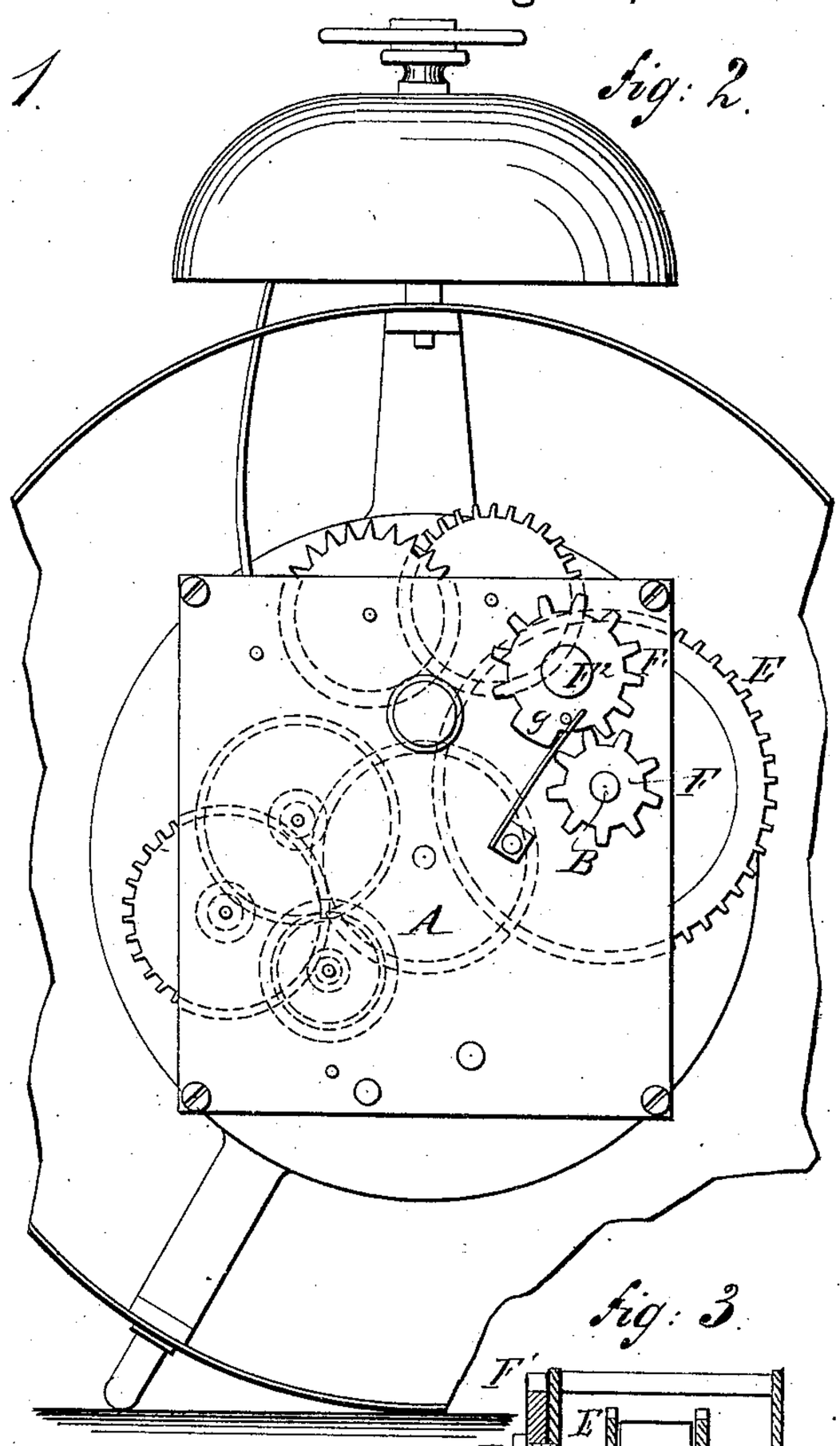


Fig. 3.

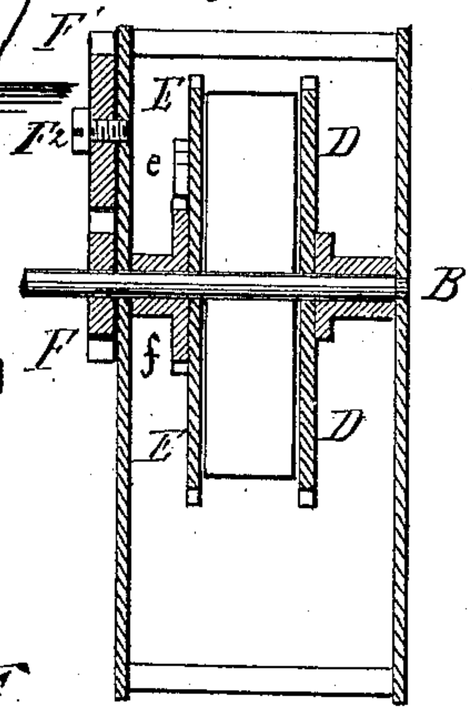


Fig. 4.

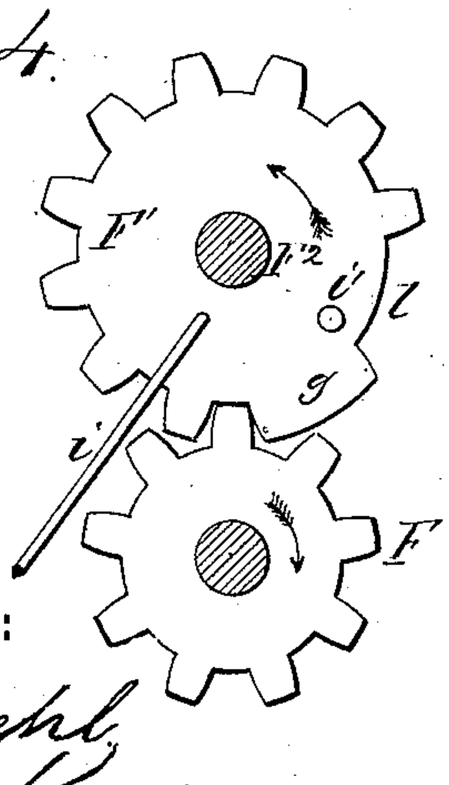
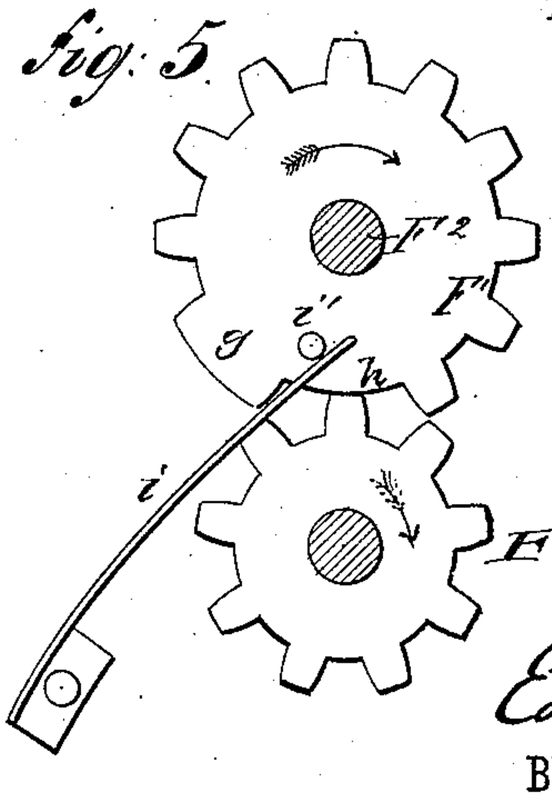


Fig. 5.



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EDWARD DAVIES, OF BROOKLYN, NEW YORK.

ALARM-CLOCK.

SPECIFICATION forming part of Letters Patent No. 304,080, dated August 26, 1884.

Application filed January 24, 1884. (Model.)

To all whom it may concern:

Be it known that I, EDWARD DAVIES, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Alarm-Clocks, of which the following is a specification.

This invention relates to an improved alarm-clock of that class in which the mainspring is employed for actuating the time-movement of the clock as well as the alarm mechanism of the same, the means employed for this purpose being of simple construction, and so arranged as to be within view, whereby the irregular functioning of the alarm mechanism is avoided.

The invention consists of an alarm driving-wheel placed loosely upon said arbor and taken along by a pawl-and-ratchet device, a pinion keyed to the winding-arbor and meshing with a stop-gear wheel, that is provided at one part of its circumference with segmental tooth and adjoining thereto with a recess of larger size. A spring attached to the rear wall of the clock-frame engages a pin upon the stop-gear wheel, and causes the latter to skip the teeth of the pinion when the mainspring is wound up, so that the pinion and its stop-gear are in a position to admit the working of the alarm-movement when the alarm is liberated.

In the accompanying drawings, Figure 1 represents a sectional side elevation of an alarm-clock with my improved alarm mechanism applied thereto. Fig. 2 is a rear elevation of the clock-movement. Fig. 3 is a vertical transverse section through the mainspring, showing the winding-arbor and alarm stop-motion; and Figs. 4 and 5 are detail views of the alarm stop-motion, showing it respectively in position after the alarm has been sounded and in position ready for starting.

Similar letters of reference indicate corresponding parts.

A represents the movement of an alarm-clock of that class in which the mainspring is employed for actuating the time and alarm movements. B is the winding-arbor, and C the mainspring, the inner end of which is attached to the arbor, while the outer end is attached in the usual manner, by a stud or other fastening device, to the main driving-wheel D of the time-movement. The main driving-wheel D is loose upon the arbor B, so as to turn freely thereon in following the expansion of the mainspring C, but connected thereto by the usual pawl and ratchet-wheel. On the other side of the mainspring is located upon the arbor B the driving-wheel E of the alarm-movement. This wheel is also loose upon the arbor B, but connected thereto by a pawl, *e*, which is pivoted to the wheel E, and kept by a spring in engagement with a fixed ratchet-wheel, *f*, on the winding-arbor B. When the arbor B is turned so as to wind up the mainspring C, the ratchet-wheel *f* skips past the pawl *e*, while, when the winding is interrupted, the pawl *e* engages the ratchet *f*, and checks thereby the unwinding of the spring. To the winding-arbor B is further keyed a pinion, F, which meshes with a stop-gear, F′, that is loosely mounted on a short independent shaft, F², that is secured to the clock-frame. The gear-wheel F′ is provided at one point of its circumference with segmental tooth *g* of nearly twice the length of a common tooth, and adjoining thereto with a recess, *h*, which latter is formed by breaking out a tooth on the circumference of the gear-wheel. The segmental tooth *g* forms the stopping-tooth of the alarm stop-motion, while the recess *h*, adjoining the stop-tooth *g*, permits the turning of the arbor B, when the mainspring is wound up, without being blocked by the stop-tooth *g*.

To keep the teeth of the stop gear-wheel F′ in mesh with the teeth of the pinion F, a spring, *i*, that is attached to the rear wall of the clock-frame, presses by its free end on a a pin, *i′*, of the stop-gear F′ and returns the latter into mesh with the pinion F, as shown in Figs. 2 and 5. Each tooth of the pinion moves the stop-gear F′ far enough so that the tooth of the stop-gear next to the recess *h* is cleared, after which said tooth is moved by the spring *i* and pin *i′* into contact with the next following tooth of the pinion F, as indicated in Fig. 5. The stop-gear F does not therefore interfere with the winding up of the clock.

Any well-known alarm setting and liberating devices may be used in connection with my improved stop-motion, which devices require no special description. Whenever the alarm is liberated at the time for which the

same has been set by the mechanism arranged for this purpose, the main driving-wheel E of the alarm-movement actuates the train of gear-wheels which oscillate the hammer that is fast on the pallet-spindle of the escapement-wheel of the alarm-movement, so that the gong is sounded. The action of the inner end of the mainspring C on the arbor B and the alarm driving-wheel E rotates the latter and turns simultaneously the pinion F. This pinion, being in mesh with the stop gear-wheel F′, turns the same in the direction of the arrow shown in Fig. 5 until the stop-tooth *g* abuts against one of the teeth of the pinion F, as shown in Fig. 4, and causes thereby the stopping of the alarm-movement. The stop-gear wheel F′ remains in this position until by the next winding up of the clock the pinion F is turned in the direction of the arrow marked thereon in Fig. 4, whereby the intermeshing stop-gear wheel F′ is returned from the position shown in Fig. 4 to the position shown in Fig. 2. In continuing to wind up the mainspring the spring-acted stop-gear skips the teeth of the pinion F, as indicated in Fig. 5, until the spring is entirely wound up, leaving the pinion F and stop-gear F′ in a position for allowing the alarm-movement to be actuated whenever the alarm is liberated. The alarm-movement continues to act during the time in which the stop-tooth *g* moves around from a position at one side of the pinion F to its position at the other side of the same, when the locking of the pinion F by the stop-tooth *g*, and thereby the stopping of the alarm-movement, takes place. The action of the alarm-movement, and consequently the unwinding of the inner end of the mainspring, is thereby restricted to the distance through which the stop-tooth *g* travels until it comes around to its stopping contact with the teeth of the pinion F, as shown in Fig. 4.

It will be seen that the alarm-movement is restricted to less than a single turn of the arbor B, so as to require but a small portion of the force of the mainspring to actuate the alarm-movement. If it is desired to use even a smaller part of the power of the mainspring, the solid portion *g* is extended along a greater part of the circumference of the stop-gear F′, whereby the action of the alarm-movement is restricted to a fractional part of a rotation of the alarm driving-wheel E.

In my improved alarm stop-motion the ringing of the gong is not confined to one entire alarm driving-wheel, or to a fractional rotation of the same; but the alarm may be kept striking for several turns of the alarm driving-wheel by simply establishing the proper porportion of the number of teeth of the pinion to the number of teeth of the stop-gear. If, for instance, the pinion has six and the stop-gear twelve teeth, the alarm will be kept ringing for two turns of the driving-wheel, while with four teeth of the pinion and twelve of the stop-gear the alarm will be continued for three turns of the driving-wheel, and so on. When the alarm-movement is started and has completed its motion, it is stopped positively and uniformly by the stop-tooth *g*, when it abuts against the teeth of the pinion.

The resetting of the stop-gear F′ into a position to admit the operating of the alarm-movement is accomplished by winding up the clock, as before described.

I prefer to arrange the alarm stop-motion, composed of the pinion F, stop-gear F′, and spring *i*, on the outside of the clock-frame, as shown in Fig. 2, instead of at the inside, whereby said gears can readily be seen and any irregular position be readily corrected.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The combination, with the winding-arbor B, mainspring C, and alarm driving-wheel E, connected by pawl and ratchet to the winding-arbor, of a pinion, F, keyed to the winding-arbor, a stop-gear, F′, meshing with the pinion, and having an enlarged tooth, *g*, an adjoining space, *h*, and a pin, *i′*, engaged by a spring, *i*, attached to the clock-frame, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

EDWARD DAVIES.

Witnesses:
OTTO RISCH,
SIDNEY MANN.