

(No Model.)

J. W. NUNAMAKER.
ALARM WATCH.

Patented July 23, 1895.

No. 543,048.

Fig. 1.

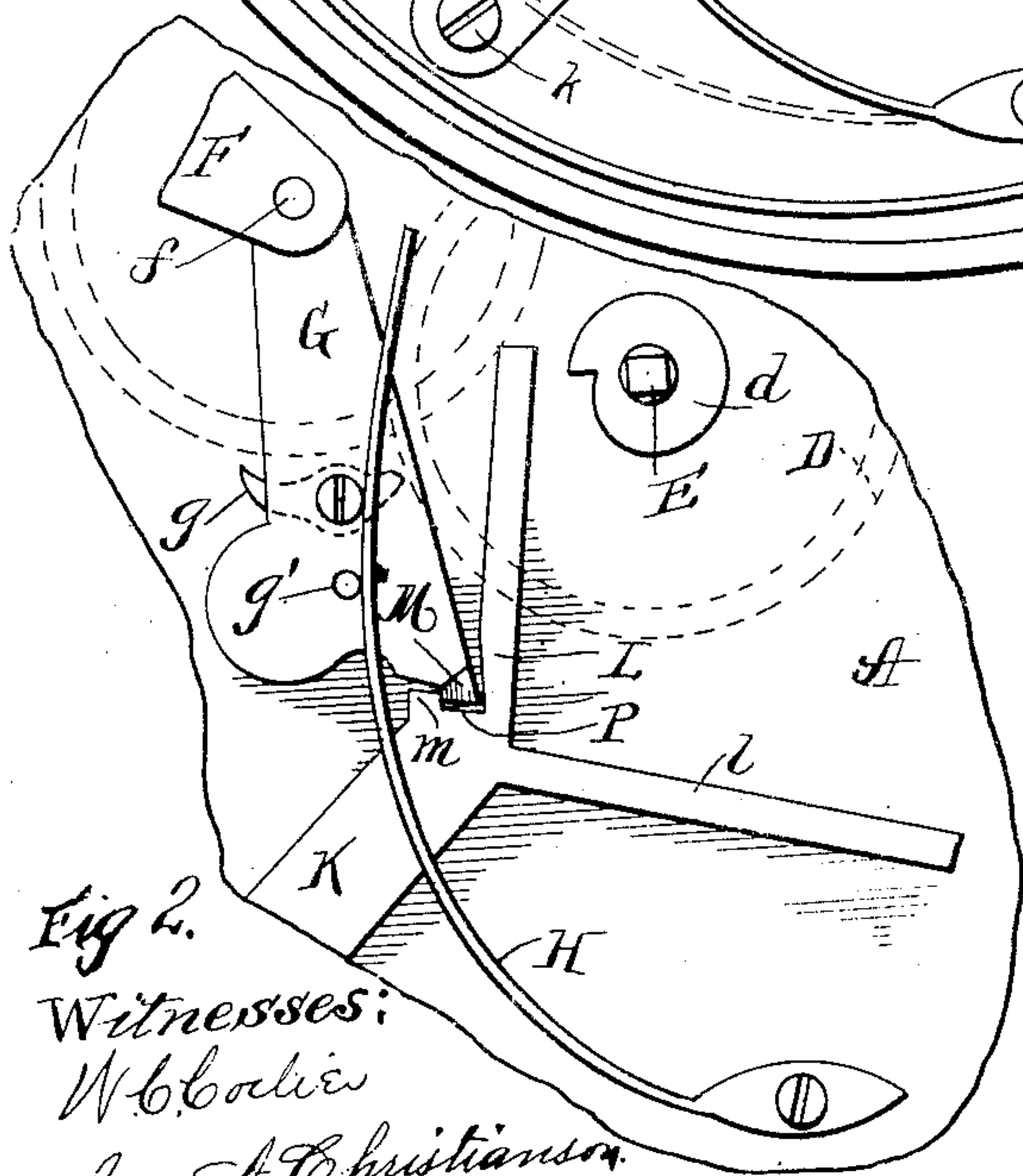
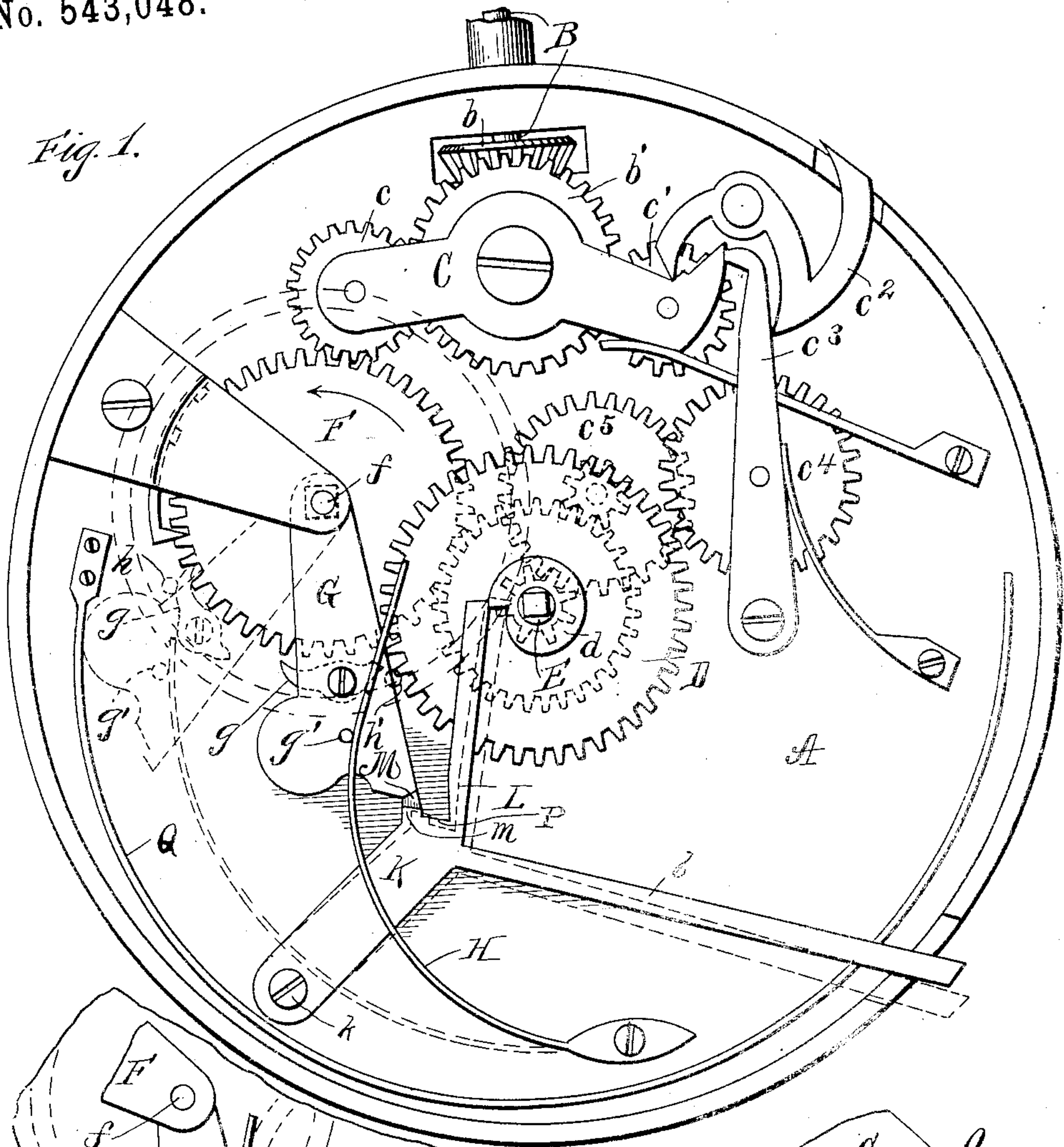


Fig. 2.

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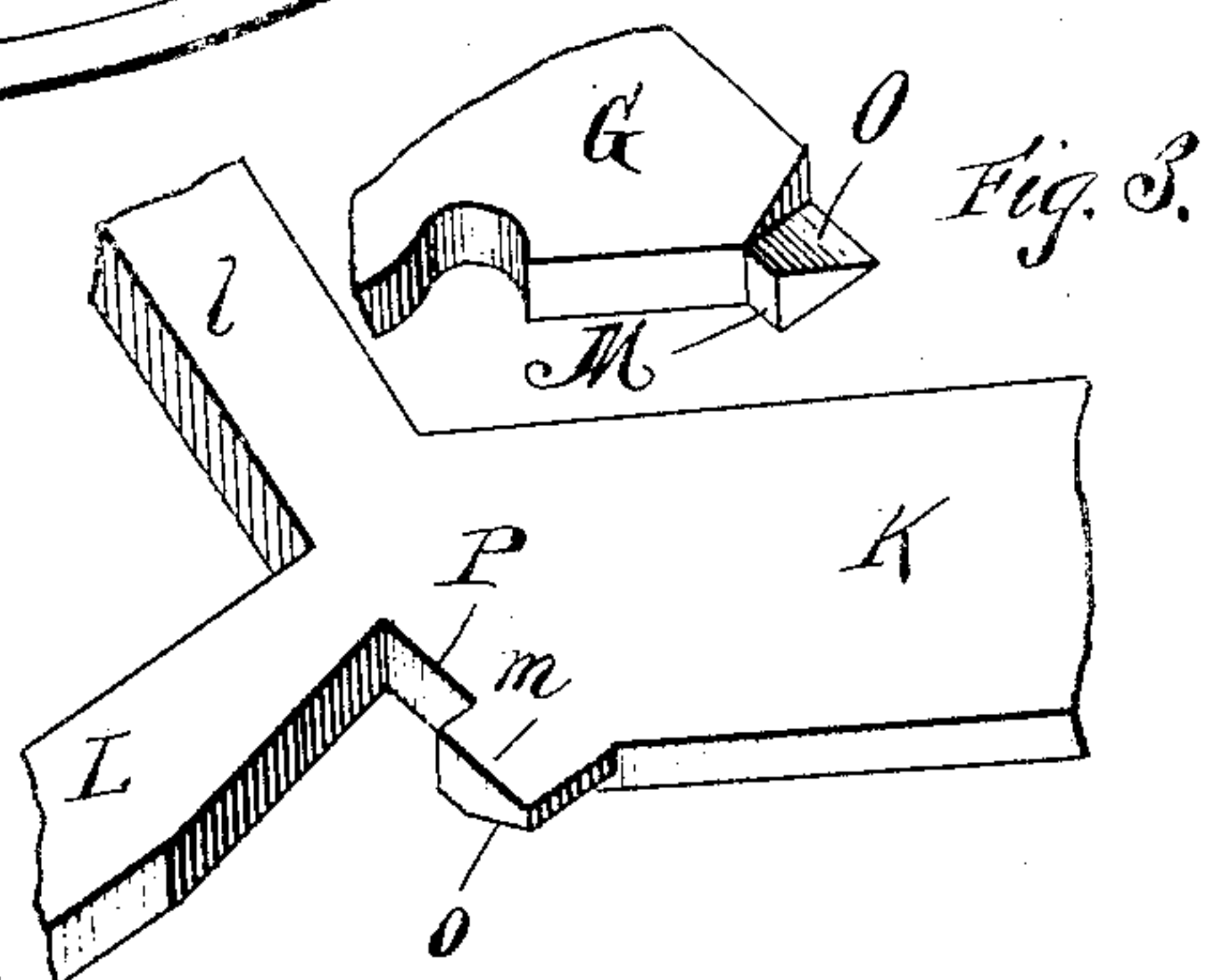


Fig. 3.

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JOHN W. NUNAMAKER, OF CHICAGO, ILLINOIS.

ALARM-WATCH.

SPECIFICATION forming part of Letters Patent No. 543,048, dated July 23, 1895.

Application filed August 9, 1894. Serial No. 519,814. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. NUNAMAKER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Alarm-Watches; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it

appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to the mechanism for operating the alarm in watches in which such attachments are employed. Its object is to provide improved means for setting the alarm by means of the watch-stem and also to provide for the adjustment of the alarm mechanism in winding the watch.

The invention consists of a special form and arrangement of a system of levers and gears whereby the mechanism ordinarily employed for setting the watch may be adjusted so as to set either the alarm or the time-indicating hands of the watch.

It consists, further, of a spring-controlled swinging arm or its equivalent pivoted upon the arbor of the mainspring, with means for automatically connecting it with and disconnecting it from the ratchet, a novel device for holding the arm against the spring until released by the action of the cam ordinarily employed for such purposes.

The drawings are, for the purpose of clearness, made upon an enlarged scale, and represent, in—

Figure 1, a plan view of the watch-movement. Fig. 2 is a portion of the same, showing the alarm mechanism in a different position, and Fig. 3 shows details of some of the parts.

The alarm shown is not material to this application, but is introduced for the purpose of illustrating the use to which the invention is to be applied.

The upper plate of the watch is represented at A; the stem at B; the beveled gear carried by the stem at *b*, and the pinion meshing with this gear at *b'*. A yoke C is pivoted upon the arbor of the pinion *b'* and carries at one end a pinion *c* in mesh with the pinion *b'* and ca-

pable of being thrown into engagement with the ratchet-wheel F of the mainspring for winding the watch. At the opposite end of the yoke C is mounted a pinion *c'* in mesh with the pinion *b'* and capable of being brought into engagement with the pinion *c''* for setting the watch and with the pinion *c'''*, carried by the swinging arm *c''*, for setting the alarm. The yoke C is controlled by the lever *c''*, projecting through the rim of the watchcase. The arm *c''* is under the pressure of a spring, whereby its free end, which is bent to project laterally, is thrown against the end of the yoke C when the watch is adjusted for winding the mainspring, as shown in Fig. 1.

The end of the yoke C, co-operating with the lever *c''*, has an upwardly-projecting extension whose inner face is stepped or notched. The inner end of the lever *c''* bears against the upper edge of the yoke C, and when drawn outwardly through the rim of the case it bears the yoke downwardly by riding up onto its lateral projection. When the end of the lever *c''* reaches the notch upon the lateral projection of the yoke, the latter has become sufficiently depressed to free the lateral projection of the lever *c''*. This lever *c''*, being now thrown still farther forward toward the yoke C, the wheel or pinion *c''* is caused to mesh with the wheel D and also with the pinion *c'*. The wheel D is mounted upon the staff E of the center wheel of the watch and carries the convolute alarm-cam *d*. When the parts have been thus shifted, it will be seen that the pinion *c* has been disengaged from the ratchet-wheel F, and the turning of the stem B shifts the convolute cam *d*, so as to set the alarm.

In order to set the hands of the watch the lever *c''* is still farther withdrawn, its inner end riding upon the inner face of the lateral projection of the yoke C, thus still further depressing the yoke and bringing the pinion *c'* into engagement with the pinion *c''*, which controls the hands. The yoke C has now been so far depressed that the inner end of the lever *c''* comes into contact with the lateral projection of the lever *c''*, thereby forcing this lever back and disengaging the wheel *c''* from the wheel D.

The yoke C is normally held in the position shown in Fig. 1 by a spring when not depressed by the extension of the lever *c''*. The

inner face of the lateral extension of the lever c^3 is so beveled that the end of the lateral extension of the yoke C comes in contact with it as the yoke returns to its normal position, the lever is forced backwardly and assumes the position shown in Fig. 1.

A swinging arm G is loosely hung upon the arbor f of the mainspring and carries a pivoted dog g , adapted to engage the teeth of the mainspring-ratchet F in such manner as to lock the arm to the ratchet, so that as the latter is turned in winding the watch the former is swung toward the center of the watch against the resistance of a spring, as H, attached to the plate A, and bearing against a pin g' set in the arm G.

The dog g has two projecting ends, both of which are curved upon their outer edges to serve as cams for contact with suitable pins for tilting the dog and thereby making and breaking the connection between the arm and the ratchet. The pin h , set in the plate A at the limit of the backward movement of the arm G, throws the nose of the dog g into engagement with the teeth of the ratchet F. The pin h' , set in the plate A at the limit of the forward movement of the arm G, rocks the dog in the opposite direction and throws it out of engagement with the ratchet F.

The detent for holding the arm G after it is released from the ratchet is a three-armed lever, its main arm or stem K being pivotally attached to the plate A near its edge, its actuating-arm L bearing against the periphery of the cam d and its controlling-arm l projecting through the edge of the case.

At the swinging end of the arm K there is a shoulder m for the engagement of a toe-piece M at the extreme end of the arm G. The shoulder m and toe-piece M are formed with co-operating surfaces, so inclined that when they are in contact the pressure of the spring H tends to force the lever L against the cam d , and when the lever is in contact with the enlarged portion of the cam the toe-piece M is prevented from sliding upon the shoulder m , but when the lever falls from the shoulder of the cam to its depressed portion the inclination of the shoulder m is so changed that the toe-piece freely slides upon it and the arm flies back under the pressure of its spring H.

The end of the toe-piece M and top of the shoulder m are brought into co-operation in the following manner:

Between the shoulder m and the lever-arm L is a recess P. The upper surface of the toe-piece is formed with a bevel, as shown at O, and the under surface of the shoulder m with a corresponding bevel, as shown at o . When the arm G is carried forward, these inclined or beveled surfaces come into contact and the lever K is forced upward sufficiently to allow the toe-piece M to pass the shoulder m into the recess P. The lever K resumes its former position by reason of its own elasticity, and the arm G, being now released from en-

gagement with the ratchet F, is forced backwardly by the spring H, the end of the toe-piece M sliding upon the shoulder m until the arm is arrested in the position shown in Fig. 1.

In order to lock the alarm, the lever-arm L is thrown back to the position shown in Fig. 2 by means of the arm l , thereby throwing the inner end of the shoulder m across the path of the toe-piece M.

The alarm shown consists of a wire gong Q—such as is ordinarily employed in striking-watches—so located as to be struck by a hammer-head formed upon the rearward side of the arm G.

The arm G is capable of many modifications in form and operation and may be adapted to various forms of alarm mechanism. I believe myself to be the first to so connect an independent alarm mechanism with the winding-wheels of a watch that the alarm may be brought to a state of tension in the act of winding the watch, and that I am entitled to a patent broadly covering such construction.

I claim as my invention and desire to protect by Letters Patent—

1. In an alarm watch the combination with the mechanism for winding the watch, of independent mechanism for actuating the alarm constructed and arranged to cooperate with the winding mechanism so that in winding the watch the alarm spring is also brought to a state of tension.

2. In an alarm watch the combination with a swinging arm for actuating the alarm, of a spring for throwing the arm, means for connecting the swinging arm with the winding mechanism of the watch whereby the arm is swung in opposition to the spring when the watch is wound, and a detent for holding the alarm actuating mechanism in a state of tension.

3. In an alarm actuating mechanism for watches the combination with the main spring ratchet and arbor, of a swinging arm pivoted upon the arbor and constructed and arranged to actuate the alarm, means for making and breaking connection between the arm and the ratchet, a spring bearing upon the arm in opposition to the movement of the ratchet, and a detent for holding the arm when released from the ratchet.

4. In an alarm watch the combination with a spring controlled swinging arm for actuating the alarm and with a convolute cam having a rotary motion, of a detent lever bearing upon the cam and having a shoulder for engaging the end of the arm, the parts being so proportioned that when the lever bears upon the enlarged part of the cam it holds the arm, and when it bears upon the short radius of the cam the arm is released.

5. In an alarm watch the combination with a spring controlled swinging arm for actuating the alarm, a convolute cam for timing the alarm action and a detent lever bearing upon the cam and adapted to hold the arm, of a

shoulder on the lever and having its outer end flattened and its forward side beveled, and a toe at the end of the arm adapted to the shoulder, the parts being so proportioned that when the lever bears upon the enlarged portion of the cam the toe and the shoulder overlap when their forward edges meet, and their outer faces are brought together when their rearward sides approach, and are freed from contact when the lever bears upon the short radius of the cam.

6. The combination in an alarm watch, of a spring controlled swinging arm for actuating the alarm and a pivoted lever having a recess or notch for engaging the end of the arm, the combined length of the arm and of lever to the recess being greater than the distance between their pivotal points, whereby the arm is locked against the action of its spring.

7. In an alarm mechanism for watches the combination with the main spring ratchet, of mechanism for actuating the alarm and means for making and breaking connection between said actuating mechanism and the ratchet, a spring bearing upon said actuating mechanism in opposition to the ratchet, and a detent for holding the mechanism when released from the ratchet.

8. In an alarm watch, the combination with the main-spring arbor *f*, the ratchet *F*, fixed upon such arbor, the stem *B*, and train gears for connecting the stem with the ratchet *F*, of a swinging arm *G*, mounted loosely upon the arbor *f*, and adapted to actuate the alarm, a rocking pawl *g*, carried by the arm, a stud *h*, for forcing the pawl into engagement with the ratchet, a stud *L'*, for releasing the pawl, a spring *H*, bearing against the arm so as to be compressed as the arm is swung by the ratchet, a detent for holding the arm *G*, against the pressure of the spring when the pawl is released from the ratchet, and means for releasing the arm from the detent, substantially as described.

9. In an alarm watch the combination with the winding and setting mechanism of a watch comprising a stem *B*, the gears *b*, *b'*, a yoke or rock bar *C*, pivoted upon the arbor

of the gear *b'*, and pinions *c*, *c'*, carried upon the opposite ends of the yoke and in mesh with the gear *b'*, and adapted respectively to co-operate with the main spring ratchet and the hands, of a lateral extension at one end of the yoke and having an inclined inner face and a notch or step thereon, a lever for rocking the yoke by engaging the inclined face of its extension, an alarm cam, a gear wheel *D*, mounted with the cam, a spring controlled swinging lever having a lateral extension adapted to bear against the outer surface of the yoke extension, a gear wheel *c'*, carried by the lever and adapted to intermesh with the pinion *c'*, and wheel *D*, when the yoke is depressed to release the extension of the lever.

10. In an alarm watch the combination with winding and setting mechanism comprising pinions *c*, *c'*, carried by a rock bar or yoke for actuating respectively the main spring ratchet and the gear of the hands, and means for driving such pinions, of an alarm cam, a gear wheel *D* mounted with the cam and a gear wheel *c'*, for transmitting motion from the pinion *c'*, to the wheel *D*, a swinging lever for carrying the wheel *c'*, and having a lateral extension at its free end for bearing against the end of the yoke and thereby holding the wheel *c'*, out of engagement with the pinion *c'*, and wheel *D*, a spring for forcing the swinging lever against the yoke, a rock lever *c'*, adapted to rock the yoke and thereby release the swinging lever from its end to permit the wheel *c'* to come into mesh with the pinion *c'* and wheel *D* before the pinion *c'* comes into engagement with the setting gear, and to throw the swinging lever back when the yoke is sufficiently depressed to bring the pinion *c'*, into engagement with the setting gear, substantially as described and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN W. NUNAMAKER.

Witnesses:

LOUIS K. EILLSON,
W. C. CORLIES.