H. P. FISKE.

Striking Movement for Clocks.

No. 220,227. Patented Oct. 7, 1879.

Fig. 1

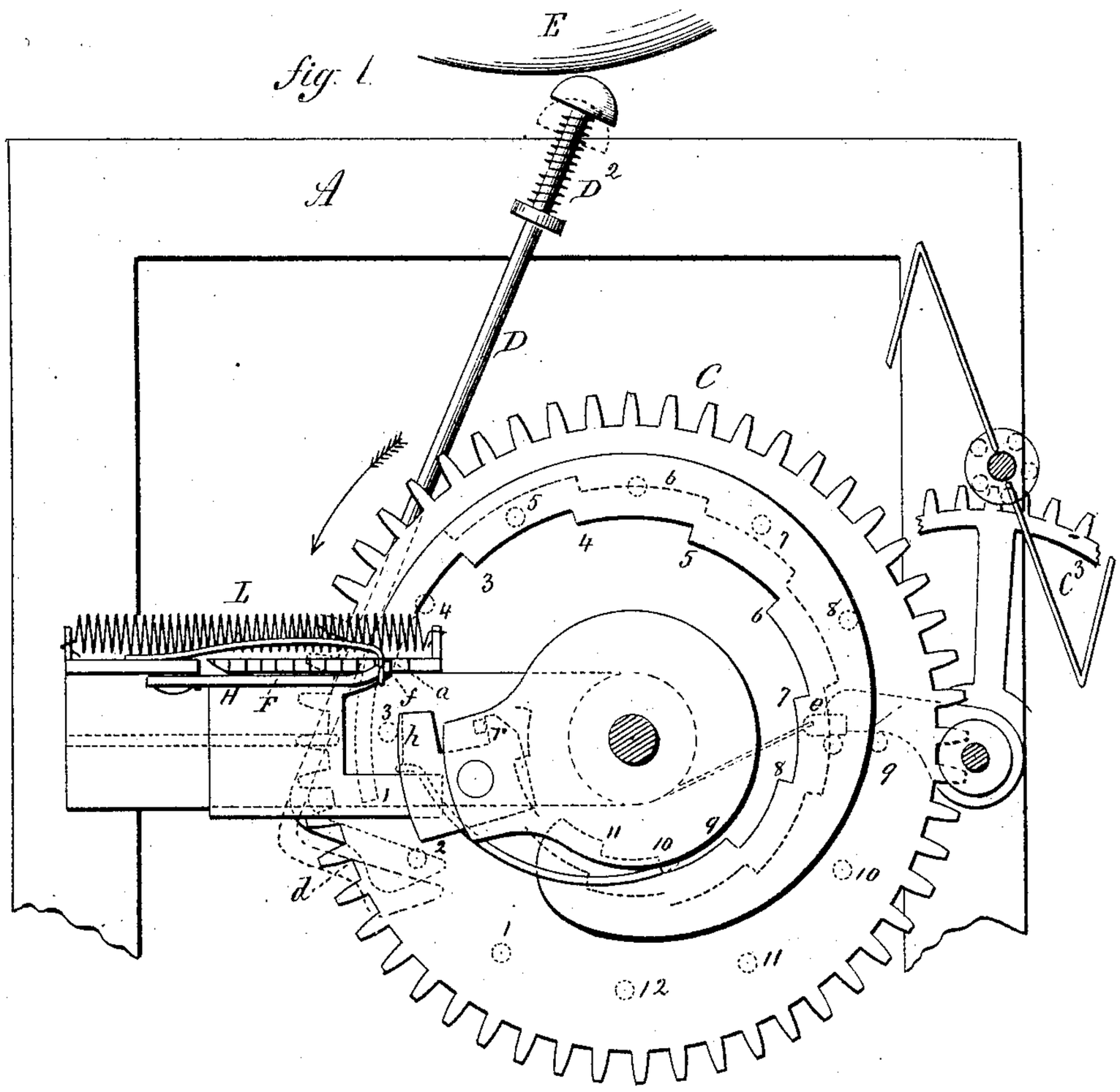


Fig. 2

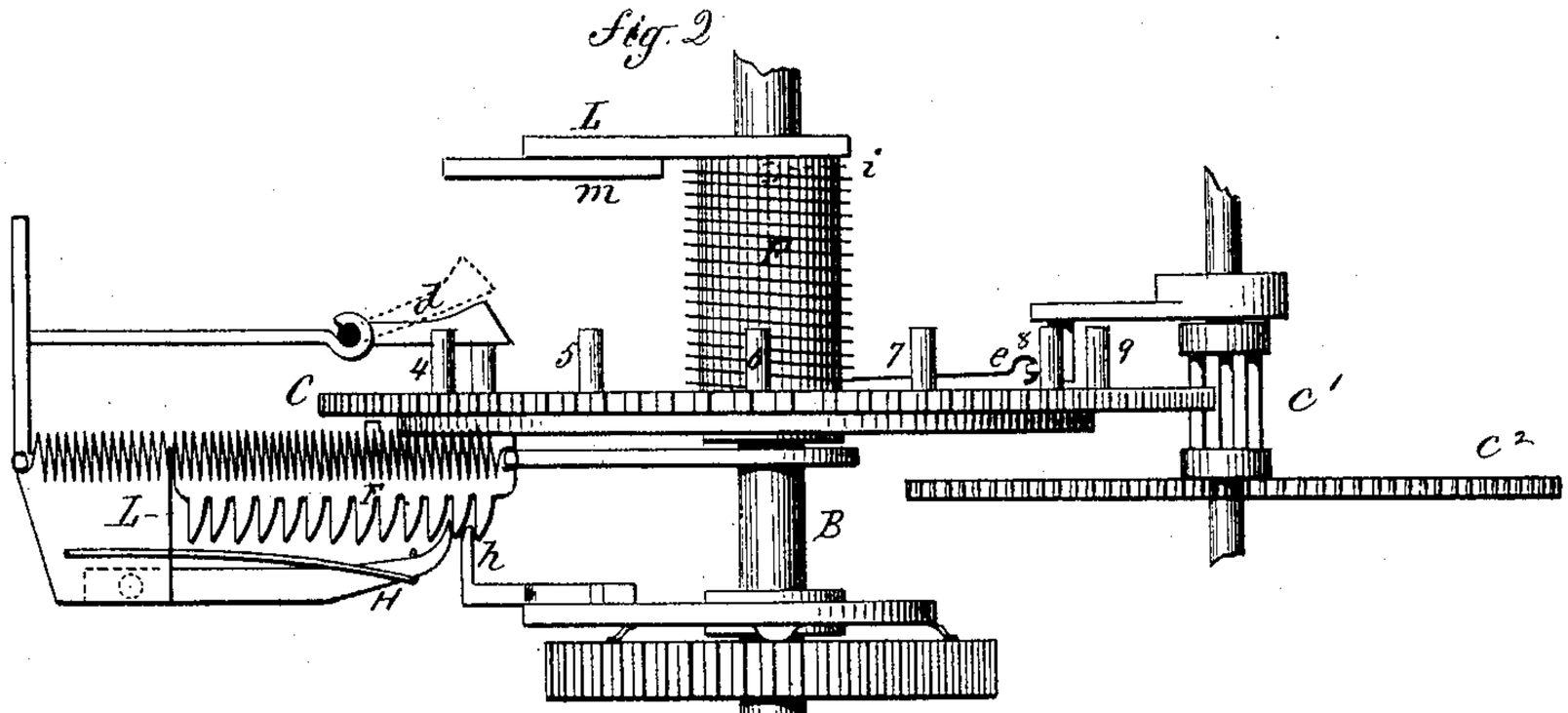
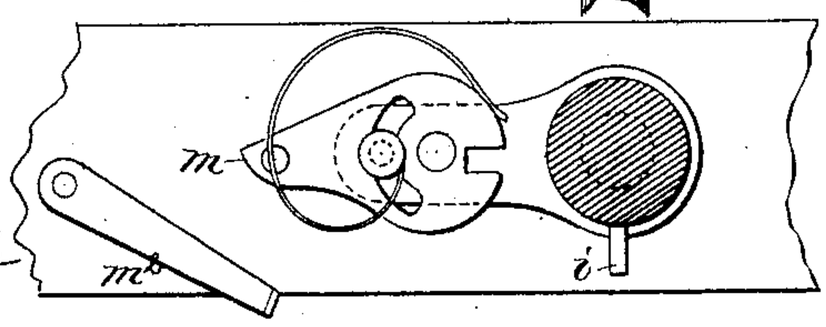


Fig. 3



Witnesses.

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HENRY P. FISKE, OF WATERVILLE, CONNECTICUT, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO ALLEN FISK, OF PORTLAND, MAINE.

IMPROVEMENT IN STRIKING-MOVEMENTS FOR CLOCKS.

Specification forming part of Letters Patent No. **220,227,** dated October 7, 1879; application filed January 21, 1879.

To all whom it may concern:

Be it known that I, HENRY P. FISKE, of Waterville, in the county of New Haven and State of Connecticut, have invented a new Improvement in Clock-Movements; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a front view of that part of the movement which relates particularly to this improvement; Fig. 2, a plan of the same; Fig. 3, detached view.

This invention relates to an improvement in that class of clock-movements in which a striking-movement is combined with the time-movement.

In the usual construction these movements are entirely independent, except that the time part trips the striking part, so that at the proper time the striking part performs its office to indicate the predetermined divisions of time, and in such movements an independent mainspring is required, so that the springs, both of the time and striking parts, must be wound in order to have each perform its office.

The object of the invention is to dispense with the spring and the train of gearing usually employed for the striking part of the movement; and the invention consists in the construction, as hereinafter described, and more particularly recited in the claim.

A represents the rear plate of the frame of the movement; B, the central or pointer shaft, to which, through the usual train of gearing, the requisite revolution is given from the mainspring. On the central or pointer shaft there is arranged a gear, C, loosely, and so as to revolve independent of the said shaft, and from this, through a pinion, C^1, and gear C^2, revolution is communicated to the fly C^3, this fly C^3 performing the same function as the fly in the usual striking-movement. On the rear of the wheel C there are twelve striking-pins, 1 2 3 4, &c., as indicated in broken lines, Fig. 1, which, as the wheel C revolves, as hereinafter described, strike in succession the arm *d* of the hammer-spindle D, and draw the spindle down until the acting pin escapes from the arm *d;* then a spring, D^2, on the hammer-spindle returns the hammer with the force required to strike the bell E. This spring may be applied in any convenient or desirable manner.

Around the hub F of the wheel C a light spring is wound, one end of which is engaged with the wheel C, the other with a stationary part of the movement *e*, as indicated in broken lines, Fig. 1. The action of this spring is to turn the wheel in the direction denoted by the arrow, Fig. 1.

On the front of the wheel C, or the side opposite the pins, are arranged or formed shoulders 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11, each succeeding shoulder from the first set nearer the center, as shown in Fig. 1, so that the distance from the successive shoulders to the center of the wheel regularly diminishes.

On a plane parallel with and in front of the wheel there is arranged a toothed rack, F, in suitable guides, so as to be moved longitudinally in a line parallel with the face of the wheel, and on the rear of this slide a stud, *f*, extends toward the wheel, and so as to come within the path of the several shoulders 1 2 3 4, &c., and so that when either of the said shoulders on the wheel strikes the said stud *f* the wheel will be stopped or its revolution arrested at that time.

The commencement of the revolution of the wheel C—that is, so that the first stroke shall be "one"—is when the shoulder 1 is above the stud *f* one space, and the slide in such a position that the shoulder 1, when the wheel C revolves, will strike the said stud; then only one division of the wheel will be passed. Now, suppose the slide to be moved inward out of the path of the shoulder 1, but in the path of the shoulder 2, then the wheel is free to turn until the second shoulder strikes the stud, when two divisions of the wheel C will have been passed, and so on through the several divisions, each shoulder indicating one blow of the hammer.

In order to move the slide F and its stud *f* inward from one shoulder to the other, a cam, *h*, is arranged on the shaft B, which, at the end of each full revolution—that is, once an hour—will engage one tooth of the slide F and

draw it inward one notch or tooth, each of which corresponds to one of the shoulders on the wheel C, and as each tooth advances a pawl, H, falls into one of the teeth of the slide, and prevents its return when the cam *h* leaves it.

A spring, L is applied to the rack, the tendency of which is to resist the inward movement of the toothed slide or rack and return the slide when free.

The power to revolve the wheel C toward the stud and to operate the hammer is imparted to it by the spring on the hub F of the said wheel C, and this spring is first set so as to have sufficient force to strike the hammer once, and at each revolution of the central shaft the spring is wound according to the number of blows or divisions of the wheel to be passed at the next striking.

On the hub of the wheel F is a stud, *i*, and on an arm, L, rigid to and projecting from the shaft B, is a pawl, *m*. (See Figs. 2 and 3.) This pawl revolves with the shaft, and in so revolving, when it comes in contact with the stud *i* on the wheel C, will cause the said wheel C to revolve and turn with it, and this revolution, being in the direction of the movement of the pointers, will consequently turn the wheel C backward, which will produce a winding of the spring on the hub of the said wheel C. The engagement of this constantly-revolving pawl with the stud of the wheel C will be made wherever that stud happens to be; and the disengagement of the pawl from the stud *i* will be made when the wheel C has been turned to the place of beginning or commencement before described, and this disengagement will be produced by the pawl coming in contact with a projection, m^2, provided for the purpose, and which will turn it away from the stud *i* when that starting-point is reached. Suppose, for illustration, that the last stroke was "two," as shown in Fig. 1, the stud will be two points from the point of starting, and, being there engaged by the pawl at its next revolution, will cause the return of the wheel C to the position before striking "one," and, as shown in broken lines, Fig. 1, consequently winding the spring to that extent, and so on as each hour is struck. The engagement between the wheel C and the revolving pawl will be made one point earlier, and at the termination of each revolution or such winding the cam *h* will have moved the rack inward one notch, so that the next striking the wheel C will advance to the next shoulder. This operation will continue until the last notch on the slide F is reached. Then the pawl H passes over the rear tooth, which is inclined, as seen in Fig. 1, and so that when the cam *h* leaves the rack the said incline on the tooth will force the pawl out of line with the teeth, when the slide will be free to be thrown back or return to its extreme rear position, and the pawl will again spring up into engagement with its proper tooth in the sleeve. This extreme movement occurs next after the shoulder 11 has rested on the stud, and when eleven strokes were given, and in that movement the stud passes outside of all the projections and leaves the wheel free for a full revolution, or coming back to its first position before striking "one," and so the movement will continue, the central or hour shaft turning the wheel C backward to wind its spring before striking is commenced; then, through the cam *h*, will adjust the slide F and its stud *f*, so that one stroke will be added each hour; and thus several of the gears necessary for the usual striking-movement, as well as its large independent spring, are dispensed with. The small spring introduced in this movement is all-sufficient to operate the hammer.

The size of the movement is greatly reduced because of dispensing with the said striking-mainspring and its train of gearing, the movement being slightly, if any, larger than the same class of time-movements.

As the returning of the wheel C necessitates the striking-pins passing the arm of the hammer, the spindle of the hammer is permitted to rock in its bearing, and the arm *d* is inclined upon its inside, so that as the wheel returns the pins will strike upon the incline and simply rock the hammer-spindle, so as to turn the arm *d* out of the path of the pins and allow them to pass one after the other, as seen in broken lines, Fig. 2, but on the forward movement will strike squarely upon the arm *d* and force the spindle downward, as seen in broken lines, Fig. 1, until the pin escapes therefrom.

In order that the pointers may be turned backward without interference with the striking mechanism, the cam *h* is hinged to an arm extending from the shaft B, as seen in Fig. 1, held rigid in its forward movement by a shoulder and stud, as at *r*, Fig. 1, but so as to turn upon its pivot when in the opposite direction, the cam striking into the teeth of the slide F.

The pawl *n* is also arranged, as seen in Fig. 3, to freely pass the stud *i* in the backward movement, but engage it forward.

This method of engagement in one direction and free in the other is well known in many classes of machinery, and any of the known devices may be substituted for those herein described to produce the same result.

Instead of a slide carrying the stud, as described, other arrangements may be applied equivalent for the said slide, it only being essential that the stud or stop shall be intermittently moved to come into contact with each successive shoulder at the proper time.

I claim—

The combination, with a time-clock movement, of a wheel on or in connection with the central or hour shaft, carrying a succession of shoulders, each successive shoulder nearer the center than the one preceding, and from the lowest to the highest number to be struck, a slide movable in a plane parallel with the plane of the said shoulders, and carrying a

stud in the path of the said shoulders, and having an intermittent movement imparted to it from the hour-shaft, so as to successively present it to the said shoulders to serve as a stop for the said wheel at predetermined intervals, a spring operating upon said wheel and shoulders, and a connection between said wheel and the hour-shaft, substantially as described, so as to receive an intermittent rear or spring-winding movement, and a hammer actuated by said wheel to strike successive blows by the forward movement of said wheel, substantially as described.

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Witnesses:
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