

No. 777,864.

PATENTED DEC. 20, 1904.

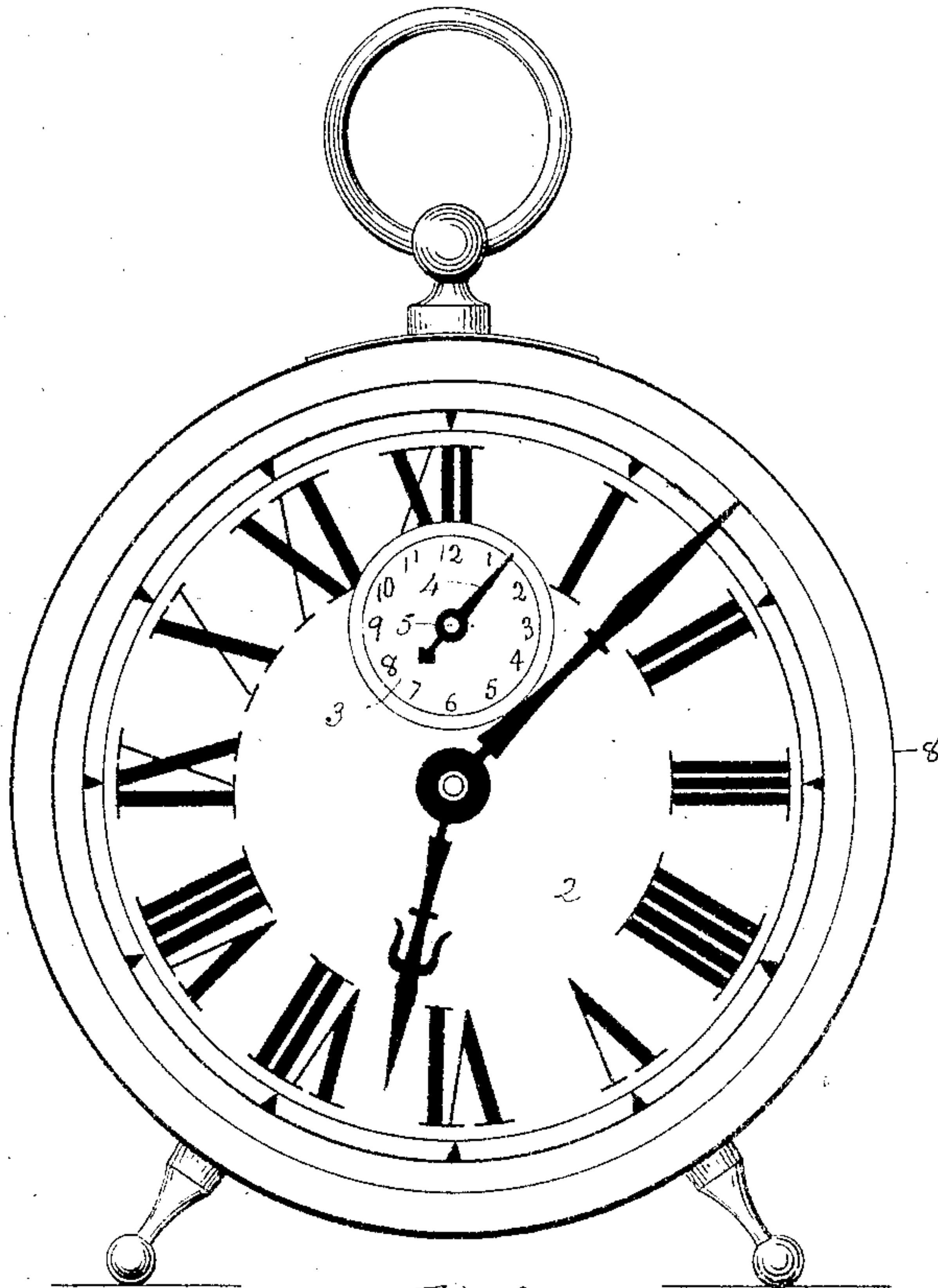
W. E. PORTER.  
ALARM CLOCK.

APPLICATION FILED SEPT. 9, 1904..

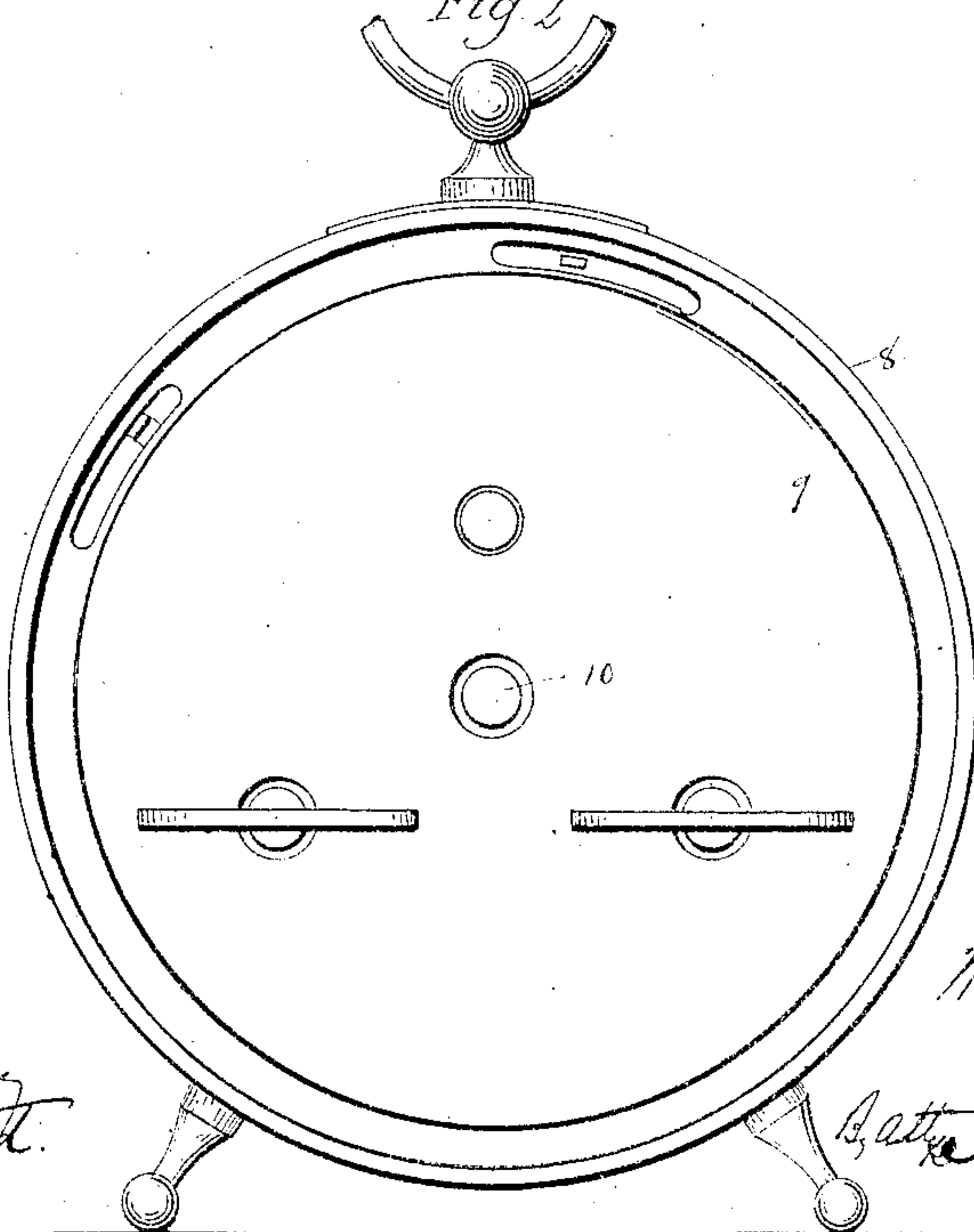
NO MODEL.

3 SHEETS—SHEET 1.

*Fig. 1*



*Fig. 2*



Witnesses  
J. H. Hummer  
Clara L. Reed.

Wilson E. Porter.  
Inventor.

By *Attorney* *Lyman & Sons*

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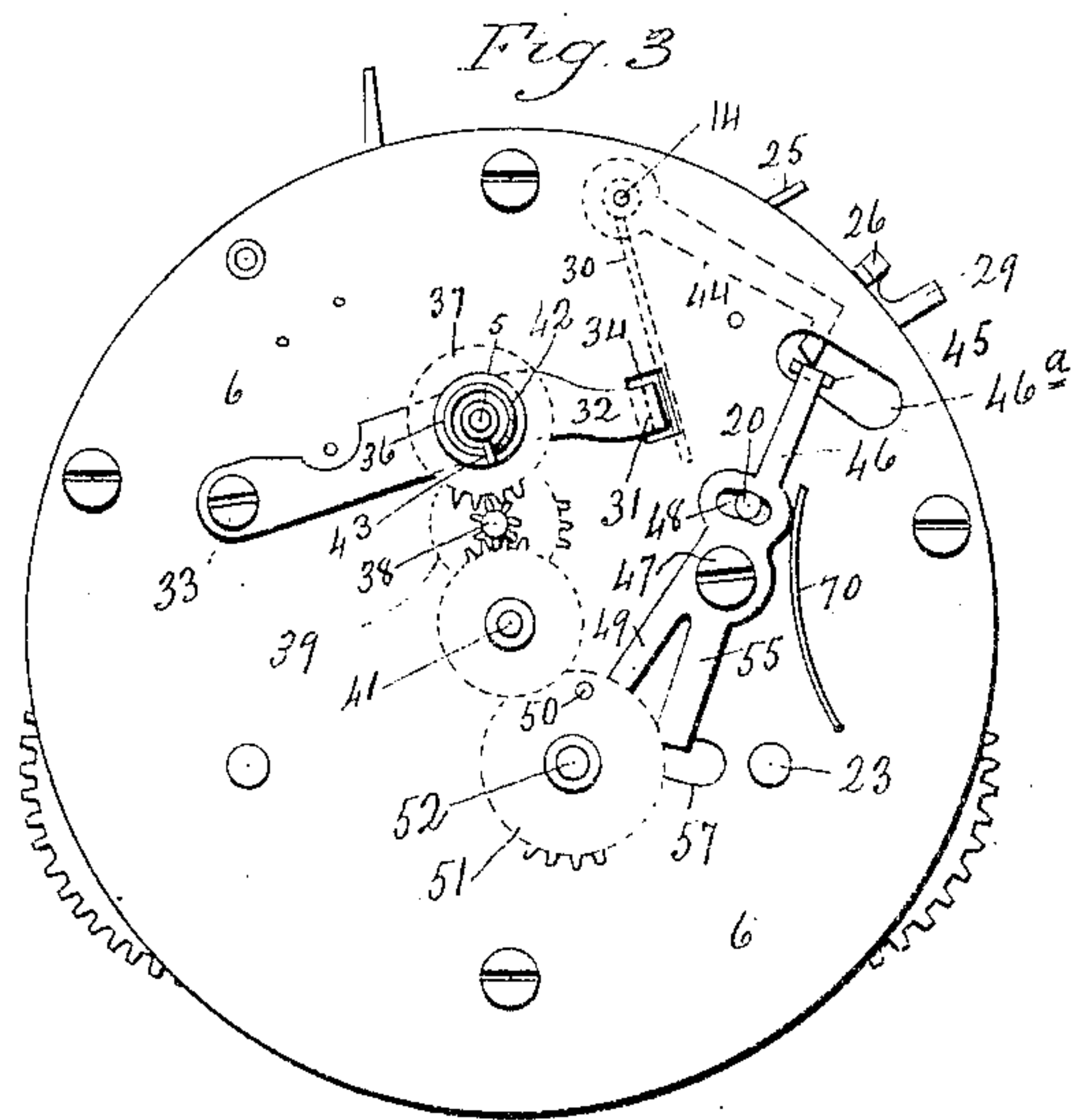
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NO MODEL.

3 SHEETS--SHEET 2.



*Fig. 4*

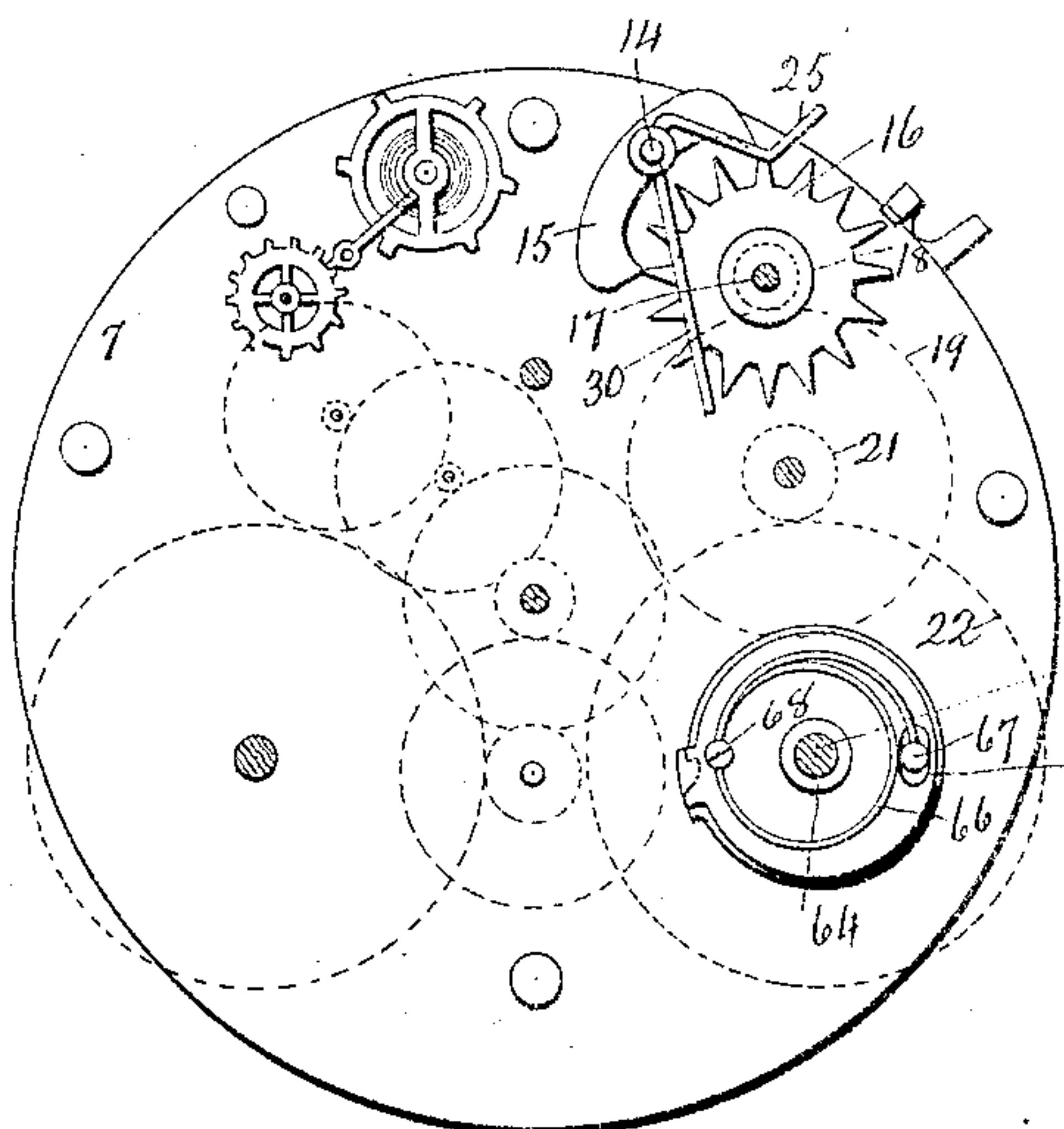
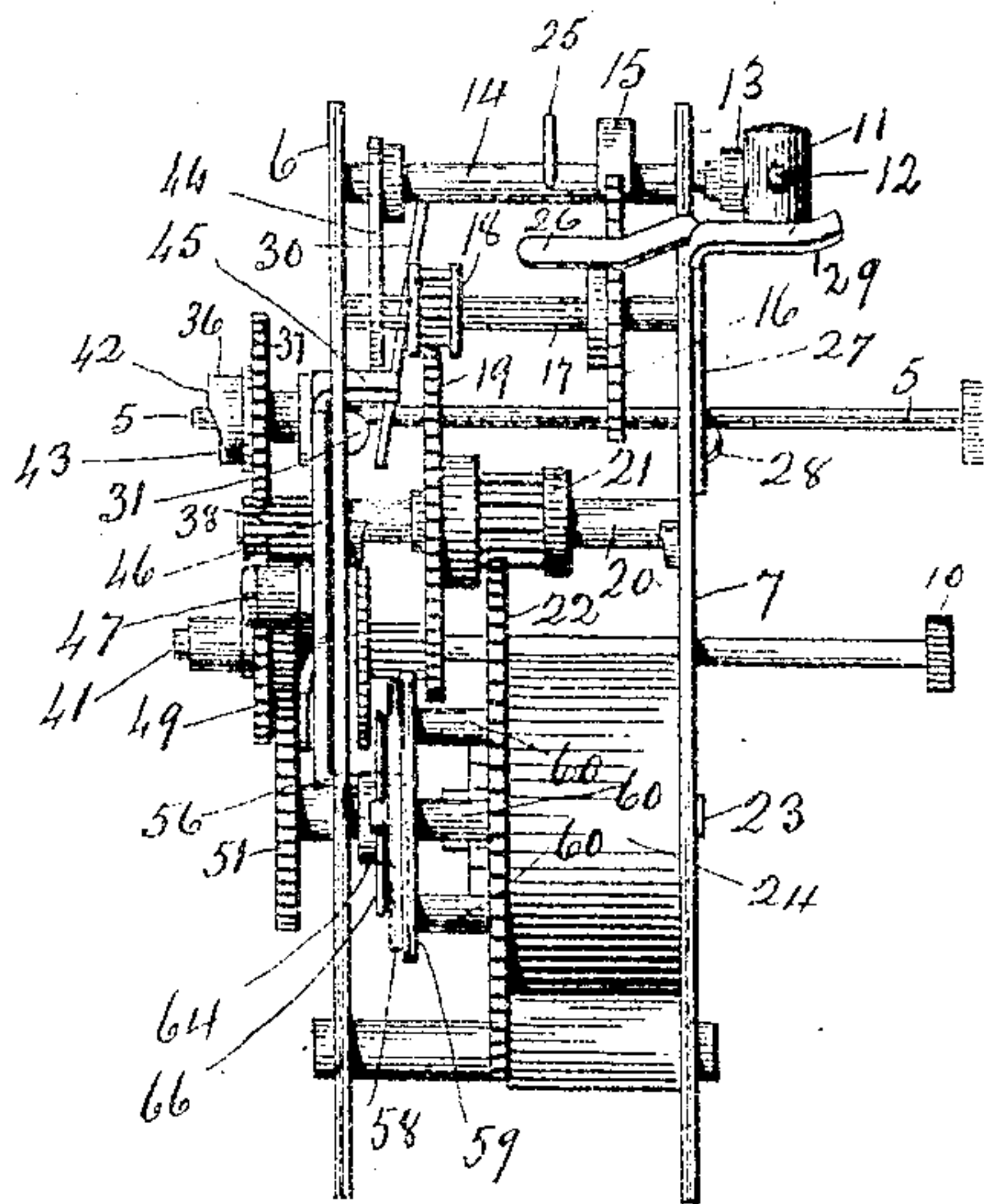


Fig. 5



*Fig. 8*

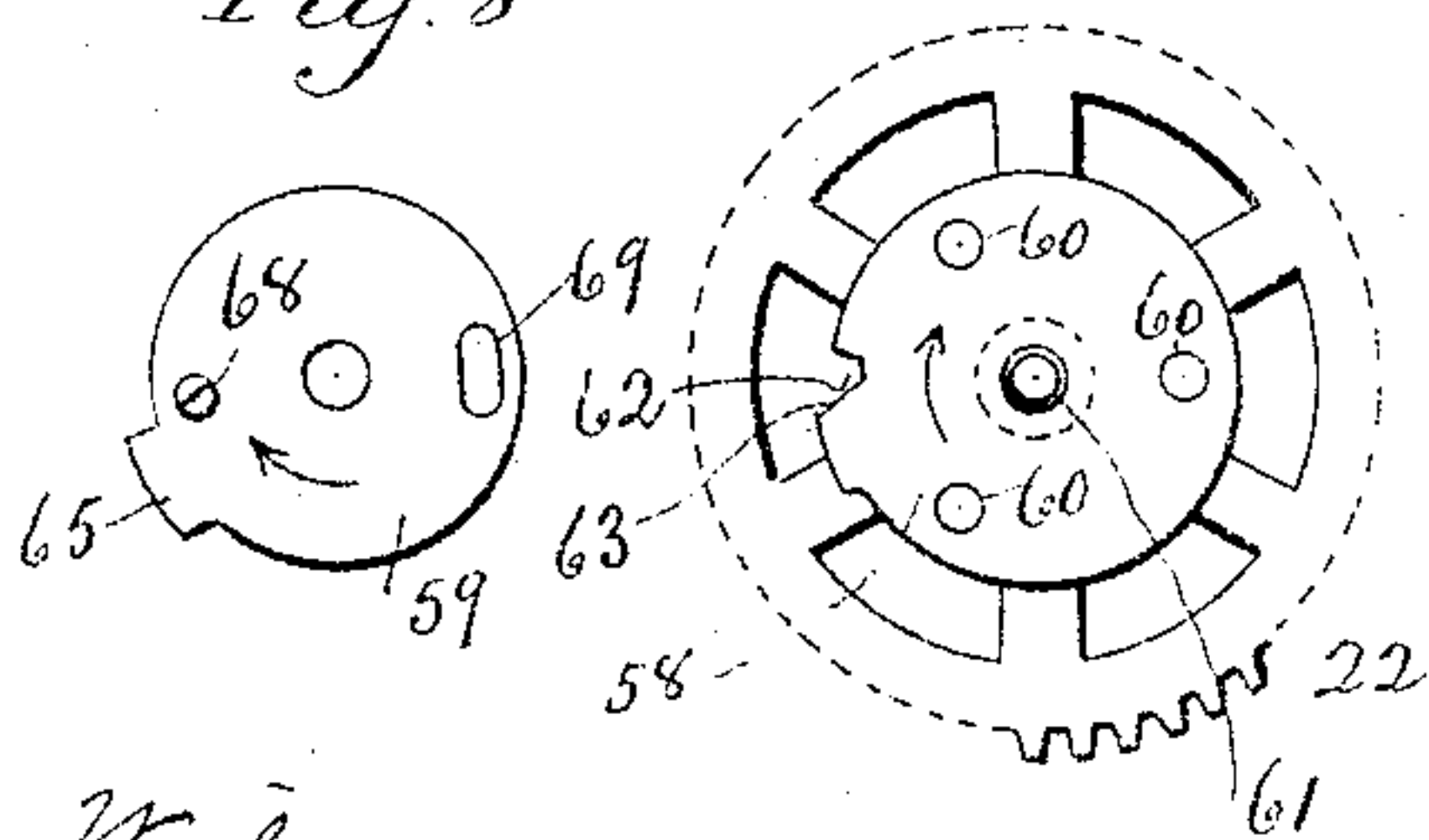
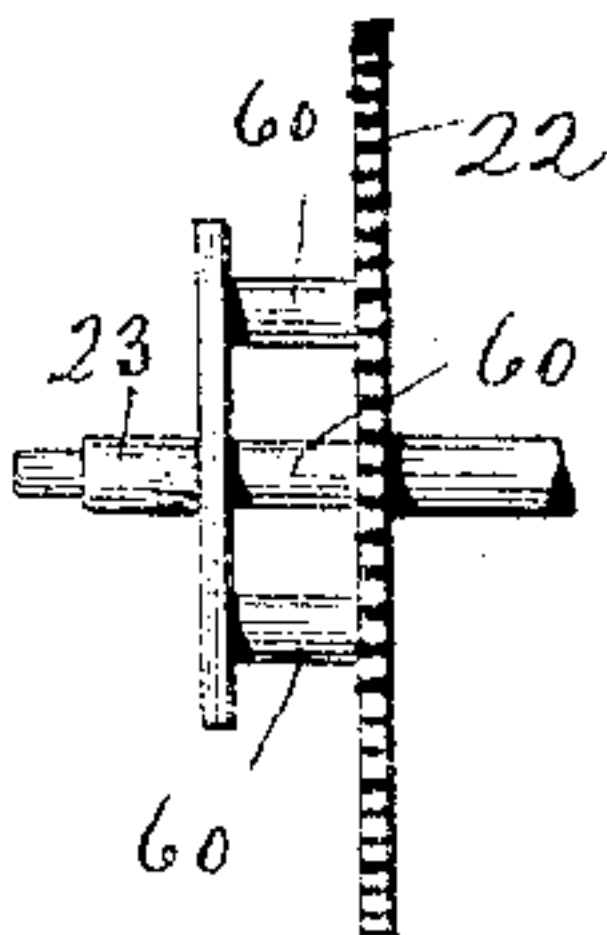


Fig. 7



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NO MODEL.

3 SHEETS—SHEET 3.

Fig. 9

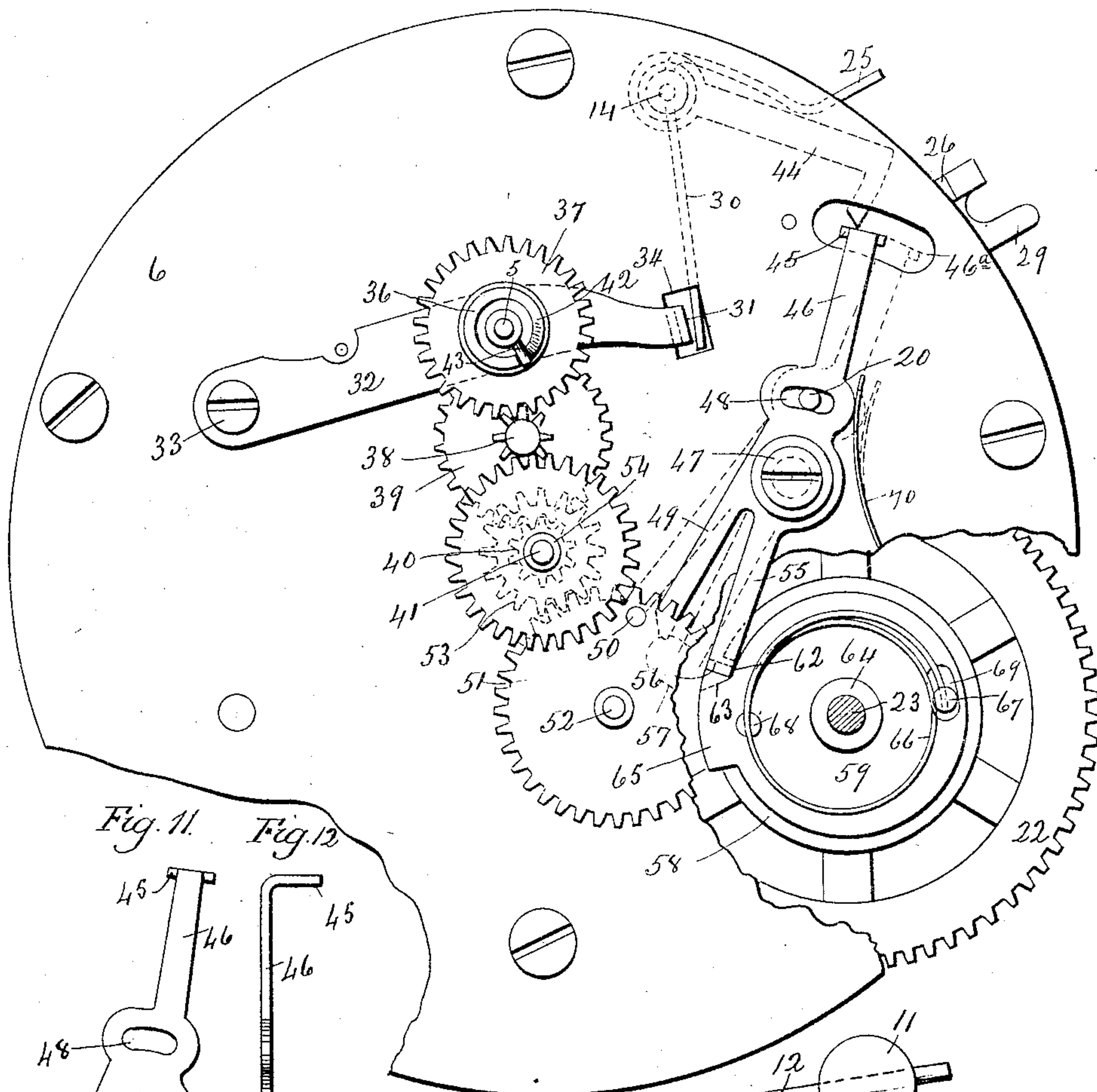


Fig. 11. Fig. 12

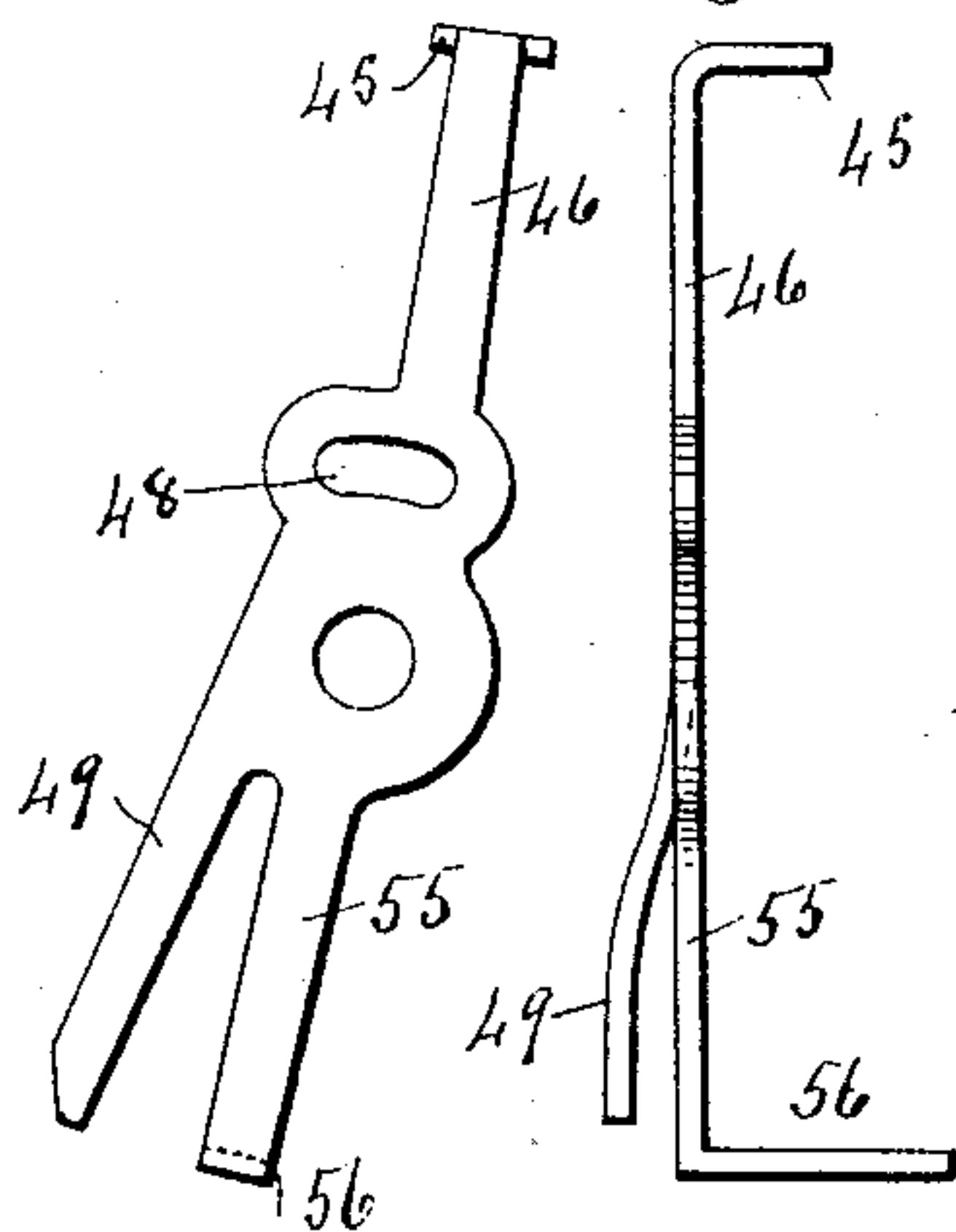
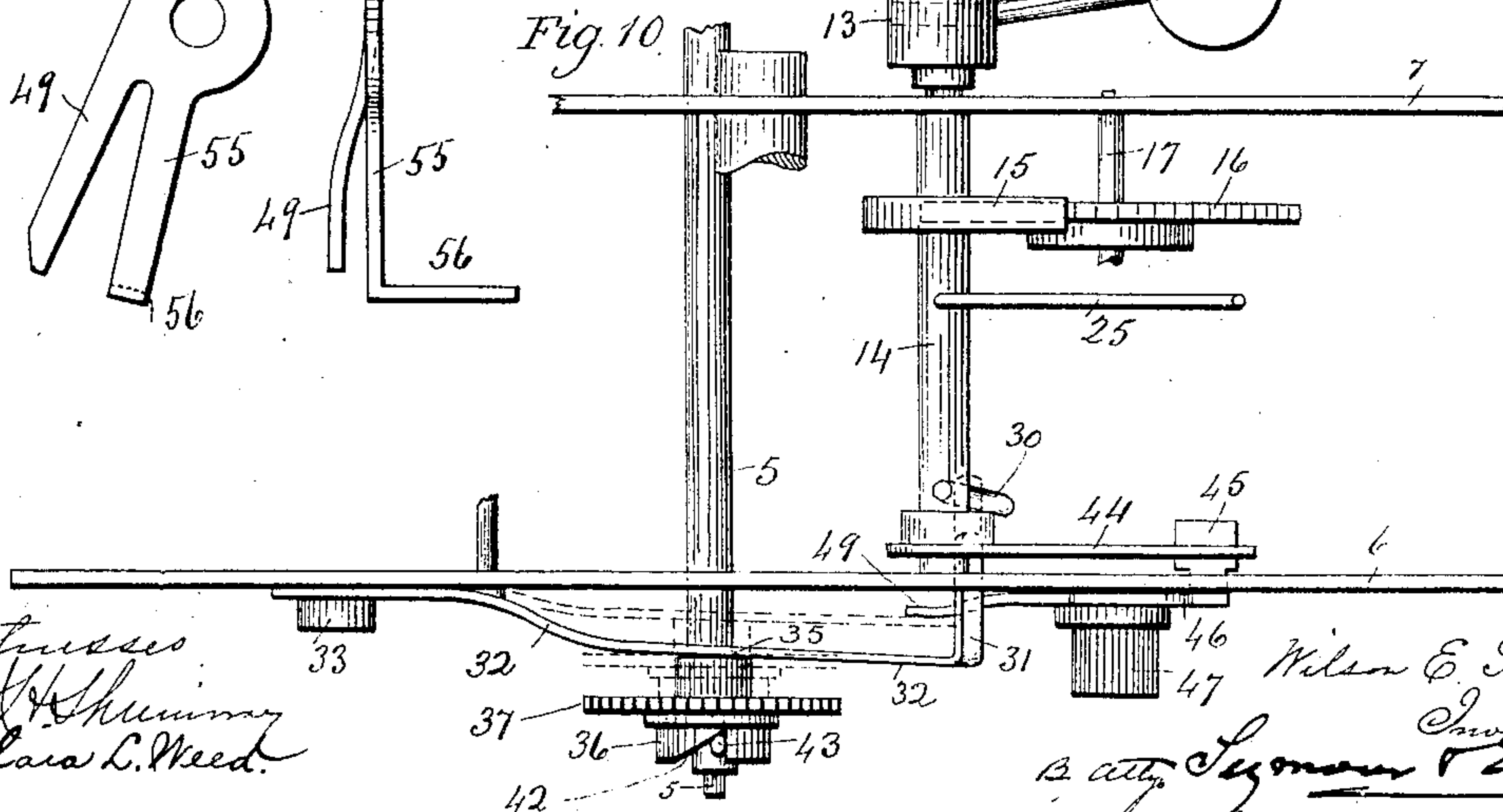


Fig. 10



Witnesses:  
H. H. Hummer  
Clara L. Weed.

W. E. Porter  
Inventor.  
By atty. Seymour & Hale



# UNITED STATES PATENT OFFICE.

WILSON E. PORTER, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE NEW HAVEN CLOCK CO., OF NEW HAVEN, CONNECTICUT, A CORPORATION.

## ALARM-CLOCK.

SPECIFICATION forming part of Letters Patent No. 777,864, dated December 20, 1904.

Application filed September 9, 1904. Serial No. 223,902.

*To all whom it may concern:*

Be it known that I, WILSON E. PORTER, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented a new and useful Alarm-Clock; and I do hereby declare the following, when taken in connection with the accompanying drawings, and the numerals 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 view in front elevation of a nickel alarm-clock constructed in accordance with my invention; Fig. 2, a rear view thereof; Fig. 3, a detached view, in front elevation, of the clock-movement; Fig. 4, a view of the movement with the front plate thereof removed; Fig. 5, an edge view of the movement looking toward the alarm mechanism; Fig. 6, a detached view, in front elevation, of the main alarm-wheel, showing the fixed supplemental alarm-cam which it carries; Fig. 7, an edge view of the said wheel and cam, showing also the alarm-winding arbor; Fig. 8, a detached view of the oscillating alarm-cam; Fig. 9, an enlarged broken view, in front elevation, of the clock-movement, showing the automatic locking-lever in its locking position by full lines and in its unlocking or retired position by broken lines; Fig. 10, a broken plan view of the clock-movement stripped except as to its alarm mechanism and showing the trip-spring in its unlocked or tripped position by full lines and in its locked position by broken lines; Fig. 11, an enlarged detached view of the automatic locking-lever; Fig. 12, a corresponding edge view thereof.

My invention relates to an improvement in alarm-clocks, the object being to produce a simple, durable, and reliable alarm-clock having its alarm mechanism organized with its time mechanism and constructed to automatically shut off the alarm, whereby the "alarm" side of the clock runs as long as the "time" side of the clock without rewinding the alarm-spring any oftener than the time-spring.

With these ends in view my invention consists in an alarm-clock having certain details

of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

As herein shown, my improvement is applied to a small clock-movement of the kind generally used in round nickeled sheet-metal cases; but of course my invention is not limited to use in such clocks, although particularly well adapted thereto. This clock has the face of its dial 2 furnished with an ordinary superimposed alarm-dial 3, figured from "1" to "12" and swept by an alarm-set hand or indicator 4, mounted upon the projecting forward end of an alarm-setting shaft or spindle 5, passing through the front and rear movement-plates 6 and 7 and projecting at its rear end through the back of the case 8 and through a sheet-metal bell 9, arranged concentrically therewith, and furnished at its projecting rear end with an alarm-setting button 10, the said bell being like a flat shallow tray. The flange of this bell is struck by a hammer 11, adjustably mounted upon a hammer-arm 12, carried by a hub 13, secured to the projecting rear end of an alarm-verge shaft 14, mounted in the plates 6 and 7 and carrying the alarm-verge 15, the pallets of which engage an alarm-escape wheel 16, mounted upon an alarm-escape shaft 17, carrying a pinion 18, meshed into by an intermediate alarm-wheel 19, mounted on a shaft 20, carrying a pinion 21, meshed into by a main alarm-wheel 22 on an alarm-winding arbor 23, to which the inner end of the alarm-spring 24 is secured. The verge-shaft 14 carries a shut-off wire 25, engaged by the shut-off arm 26 of a shut-off lever 27, hung by a pivot 28 upon the back of the rear movement-plate 7 and having a rearwardly-turned operating arm or manual 29, which projects through the back of the clock-case 8 for manual operation. The verge-shaft 14 is also provided with a downwardly-extending trip-wire 30, which coacts with a trip-finger 31, formed by bending inward at a right angle the free end of a flat sheet-metal trip-spring 32, attached by a rivet 33 to the front face of the front movement-plate 6, which is formed with a clearance-opening 34, through which the trip-finger 31 plays back and forth. The said trip-



spring 32 is formed with an opening 35 for the forward passage through it of the said alarm-setting spindle 5 and is pressed inward to move its finger 31 into position to coact with the trip-wire 30 by means of the engagement with it of the inner end of an alarm-cam 36, loosely mounted upon the projecting forward end of the said spindle 5 and carrying an alarm-wheel 37, meshed into by the dial-pinion 38, carried by the dial-wheel 39, meshed into by the cannon-pinion 40 on the center arbor 41. The cam-flange 42 of the cam 36 is engaged by a pin 43, mounted in the extreme forward end of the spindle 5. The parts above described are of ordinary and well-known construction and may be varied as circumstances dictate. They constitute the alarm mechanism of an ordinary alarm-clock. For convenience I shall hereinafter speak of the mechanism as a "twelve-hour" alarm set and trip mechanism, as it releases the alarm-train to the action of the alarm-spring not once in twenty-four hours, but once in twelve hours. In one-day alarms that is not important, as the alarm-spring is allowed to run down when the alarm "goes off" in the morning, so that when the alarm mechanism lets off at the corresponding time in the afternoon or evening nothing happens, as the spring has "run down."

To prevent these clocks from going off in the afternoon or evening, they must not be wound on the alarm side until after the time for letting off in the afternoon or evening has gone by.

I use the mechanism above described in order that the alarm side of my improved clock may be accurately set to sound an alarm in the customary way. With this twelve-hour alarm set and trip mechanism I employ what I may broadly describe as a "twenty-four-hour" alarm release and stop mechanism, which prevents the said twelve-hour mechanism from releasing the train during the day and automatically stops the train after an alarm has been sounded, so as to prevent the alarm-spring from running down. This twenty-four-hour alarm mechanism comprises a stop member in the form, as shown, of a stop-hook 44, mounted upon the projecting forward end of the verge-shaft 14 and arranged to coact with an inwardly turned stop-finger 45, arranged flatwise with respect to it and turned inward from the upper end of an oscillating stop-lever 46, the said finger 45 passing through an opening 46<sup>a</sup> in the front movement-plate 6. The said stop-hook 44, mounted, as it is, upon the verge-shaft 14, constitutes, in effect, a supplemental stop member therefor, in the sense that it acts to prevent the alarm from sounding when the trip-wire 30 is not engaged by the trip-spring 32, the trip-wire constituting, in effect, the primary stop member of the alarm mechanism. The said lever 46 swings upon a screw-stud 47, entering the front face of the said front movement-plate 6, and is formed with a

slot 48 to clear the front end of the shaft 20 of the alarm-train. An operating-arm 49, forming a part of the said lever 46, coacts with an unlocking-pin 50, projecting inwardly from a twenty-four-hour unlocking-wheel 51, turning loosely on a stud 52 and meshed into by a large supplemental pinion 53 on the hour-hand socket 54, the said wheel and pinion being proportioned so that the wheel 51 makes one revolution every twenty-four hours. The said lever 46 is also formed with an arm 55, having its lower end bent inward at a right angle to form a finger 56, passing through an opening 57 in the front movement-plate 6 and coacting with a fixed alarm-cam 58 and an oscillating alarm-cam 59. The said cam 58 is carried by three posts 60 in the main alarm-wheel 22 and formed with a central opening 61 large enough to clear the alarm-winding arbor 23. This cam is substantially circular in form, its edge, however, being broken by a "cut-off" notch 62, the forward wall of which is beveled to form a "safety-incline" 63, the purpose of which will be described later on. The oscillating cam 59 (if it may be called a "cam") is mounted, as shown, so as to oscillate upon the arbor 23, which carries a collet 64, which holds the oscillating cam against the fixed cam. The said oscillating cam is slightly smaller in diameter than the fixed cam and formed with a "stop-gap" in the form of a lug 65 which is longer than the mouth of the notch 62, which it closes temporarily to prevent the finger 56 from reëntering the notch 62 until the two cams have made one complete revolution. A light wire spring 66 in the form of a coil is secured at one end to a stop-pin 67 in the cam 58 and at its opposite end to a screw 68 in the cam 59 and exerts a constant effort to turn the oscillating cam so as to shoot its stop-gap 65 across the mouth of the notch 62 in the fixed cam, the oscillation of the cam 59 being limited by the engagement of the stop-pin 67 with the ends of a slot 69, formed in the cam 59 for the reception of the said pin. A spring 70, fixed to the front movement-plate 6, engages with the locking-lever 46 and exerts a constant effort to swing the same so as to move its stop-finger 45 under the stop-hook 44 and so as to enter its finger 56 into the notch 62 of the fixed cam 58.

It will be understood from the foregoing description that the alarm-train is restrained by the stop-hook 44 and the stop-lever 46 in addition to the restraint imposed upon the train by the trip-wire 30 and the finger 31 of the trip-spring 32, which is released by the cam 36, driven by the time side of the clock. It will be apparent, therefore, that the stop-lever 46 must be operated to clear its stop-finger 45 from the stop-hook 44 before the alarm-train can be let off by the disengagement of the finger 31 from the trip-wire 30, which takes place once in twelve hours, be-



cause the alarm-cam 36 is a twelve-hour cam. In order, however, to prevent the alarm from going off once in twelve hours, or in the afternoon or evening as well as in the morning, the stop-lever 46 is operated but once in twenty-four hours, so that when the trip-spring 32 is disengaged during the afternoon or evening from the wire 30 the alarm is prevented from going off by the coaction of the stop-hook 44 with the stop-finger 45 of the stop-lever 46; but the stop-lever 46 must of course be swung so as to disengage its stop-finger 45 from the stop-hook 44 at some time during the twelve hours preceding the sounding of the alarm. It is not important that the stop-lever 46 should be operated at any particular time during this period as long as it is in position to prevent the alarm going off in the afternoon or evening. Thus if the alarm is set to go off at 5.30 in the morning the stop-lever 46 must be set so as to prevent the alarm from going off at 5.30 in the afternoon, when the alarm-cam 36 will release the trip-spring 30. The particular time when the stop-lever 46 will be operated is determined when the hands are applied to the clock and depends upon the position that the unlocking-pin 50 occupies with relation to the operating-arm 49 of the said lever at the time the supplemental pinion 53 is meshed into the wheel 51. Let us say that the pinion 53 is intermeshed with the wheel 51, so that at one o'clock in the morning the unlocking-pin 50 will engage with the arm 49 of the lever 46 and swing the same on its screw-stud 47 so as to move the stop-finger 45 from left to right out from under the stop-hook 44, whereby the entire restraint upon the alarm-train will be thrown upon the wire 30 and the finger 31 of the trip-spring 32. When the stop-lever 46 is swung, as described, into its retired or stop-hook-releasing position, its finger 56 is lifted out of the notch 62 in the cam 58 and out of engagement with the stop-gap lug 65 of the cam 59, the spring 66 of which at once acts to turn the said cam so as to shoot the said lug 65 thereof under the said finger 56 and across the notch 62 in the fixed cam 58, thus preventing the finger 56 from reëntering the notch 62 and also preventing the spring 70 from swinging the lever 46 so as to move its finger 45 under the hook 44. Now at 5.30 in the morning when the alarm-cam 36 drops off the cam-pin 43 the alarm will be sounded. As soon as the alarm-train starts up the main alarm-wheel 22 begins to revolve the cams 58 and 59. Just before they complete a revolution the forward edge of the stop-gap lug 65 of the cam 59 engages with the inner edge of the finger 56. The oscillating cam 59 being thus held and the cam 58 continuing to rotate, its notch 62 is carried beyond the lug 65 and opened up again for the reëntrance into it of the finger 56 under the influence of the spring 70, which now turns the lever 46 so as to enter the said

finger 56 into the said notch 62 and move the said stop-finger 45 under the stop-hook 44. The alarm-train is thus automatically stopped. At the end of the next twelve hours, or at 5.30 in the afternoon, the finger 31 of the trip-spring 32 will again be disengaged from the stop-wire 30; but the alarm-train will be held by the said stop-hook 44 and stop-lever 46. Then at one o'clock during the night the unlocking-wheel 51 will again swing the stop-lever 46 into its retired or stop-hook-releasing position and lift its finger 56 out of the notch 62 in the fixed cam 58. If by any chance the lever 46 should be moved out from under the stop-hook 44 at a time when the finger 31 of the trip-spring 30 was disengaged from the wire 30, then the alarm-train would be started with the finger 56 of the lever 46 in the act of being raised out of the notch 62 in the cam 58, which would be immediately started in revolution by the starting of the alarm-train. In such an event the safety-incline 63 of the notch 62 would come into play for lifting the finger 56 out of the said notch, and thus prevent any damage to the mechanism. It may be explained in this connection that the action of the pin 50 of the wheel 51 on the lever 46 is comparatively slow, and therefore that the finger 45 at the upper end of the lever 46 will be disengaged from the stop-hook 44, so as to release the alarm-train before the pin 50 has operated to completely lift the finger 56 out of the notch 62, from which it follows that in case the alarm-train is not restrained by the wire 30 and the finger 31 of the trip-spring 32 the alarm-train would be started before the time-train had had time to lift the finger 56 out of the notch 62.

It will be seen from the foregoing that by combining my twenty-four-hour release and stop mechanism with a twelve-hour set and trip mechanism of ordinary construction I limit the letting off of the alarm to once in twenty-four hours and automatically stop it after it has sounded for a predetermined interval, so that a clock after it has once been wound up will once a day sound an alarm until it has run down on the time side as well as on the alarm side.

It is apparent that in carrying out my invention I may utilize any of the ordinary twelve-hour set and trip alarm mechanisms and that I may modify my twenty-four-hour release and stop mechanism as required to adapted it to the particular requirements of the twelve-hour alarm mechanism employed. I would therefore have it understood that I do not limit myself to the exact construction herein shown and described, but hold myself at liberty to make such departures therefrom as fairly fall within the spirit and scope of my invention.

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



1. In an alarm-clock, the combination with  
a twelve-hour alarm mechanism, of a supple-  
mentary stop member carried by the verge-  
shaft of the said alarm mechanism, a stop-le-  
5 ver coacting with the said stop member and  
normally engaged therewith, and means op-  
erated once in twenty-four hours by the time-  
train of the clock for moving the said lever so  
as to release the supplemental stop member  
10 to vibration by the twelve-hour alarm mech-  
anism.

2. In an alarm-clock, the combination with  
a twelve-hour alarm mechanism, of a twenty-  
four-hour alarm mechanism including a stop  
15 member connected with the alarm-train, and  
a lever coacting with the said stop member  
and operated once in twenty-four hours by  
the time-train.

3. In an alarm-clock, the combination with  
20 a twelve-hour alarm mechanism by which the  
alarm is set and released at a predetermined  
time, of a twenty-four-hour alarm mech-  
anism comprising a stop member connected with  
the alarm-train, a lever coacting with the said  
25 stop member and operated once in twenty-  
four hours by the time-train, and cams coact-  
ing with the said lever to cut it out of action  
during the sounding of an alarm and permit  
it to coact with the stop member to stop the  
30 alarm-train when an alarm has been sounded.

4. In an alarm-clock, the combination with  
a twelve-hour alarm mechanism, of a twenty-  
four-hour alarm mechanism to unlock the

alarm-train within the twelve hours preceding  
the sounding of the alarm and to stop the 35  
alarm-train after the sounding of the alarm,  
and the said twenty-four-hour alarm mech-  
anism comprising a supplemental stop mem-  
ber carried by the verge-shaft of the twelve-  
hour alarm mechanism, a stop-lever coacting 40  
with the said stop member, and means oper-  
ated once in twenty-four hours by the time-  
train for operating the said lever to release  
the said stop member.

5. In an alarm-clock, the combination with 45  
a twelve-hour alarm mechanism, of a supple-  
mental stop member carried by the verge-  
shaft of the said mechanism, a stop-lever co-  
acting with the said stop member, an unlock-  
ing-wheel driven by the time-train of the 50  
clock and coacting with the said lever to op-  
erate it once in twenty-four hours whereby it  
is caused to release the said supplemental stop  
member, and cams coacting with the said le-  
ver to hold it in its retired position during 55  
the sounding of an alarm and to permit it to  
coact with the said supplemental stop mem-  
ber to stop the alarm-train when the alarm  
has been sounded.

In testimony whereof I have signed this 6c  
specification in the presence of two subscribing  
witnesses.

WILSON E. PORTER.

Witnesses:

EMMA SHIELDS,  
ANNA McMAHON.