

G. A. LONG.
TELEPHONE TOLL REGISTER.
APPLICATION FILED NOV. 21, 1901.

NO MODEL.

Fig 1

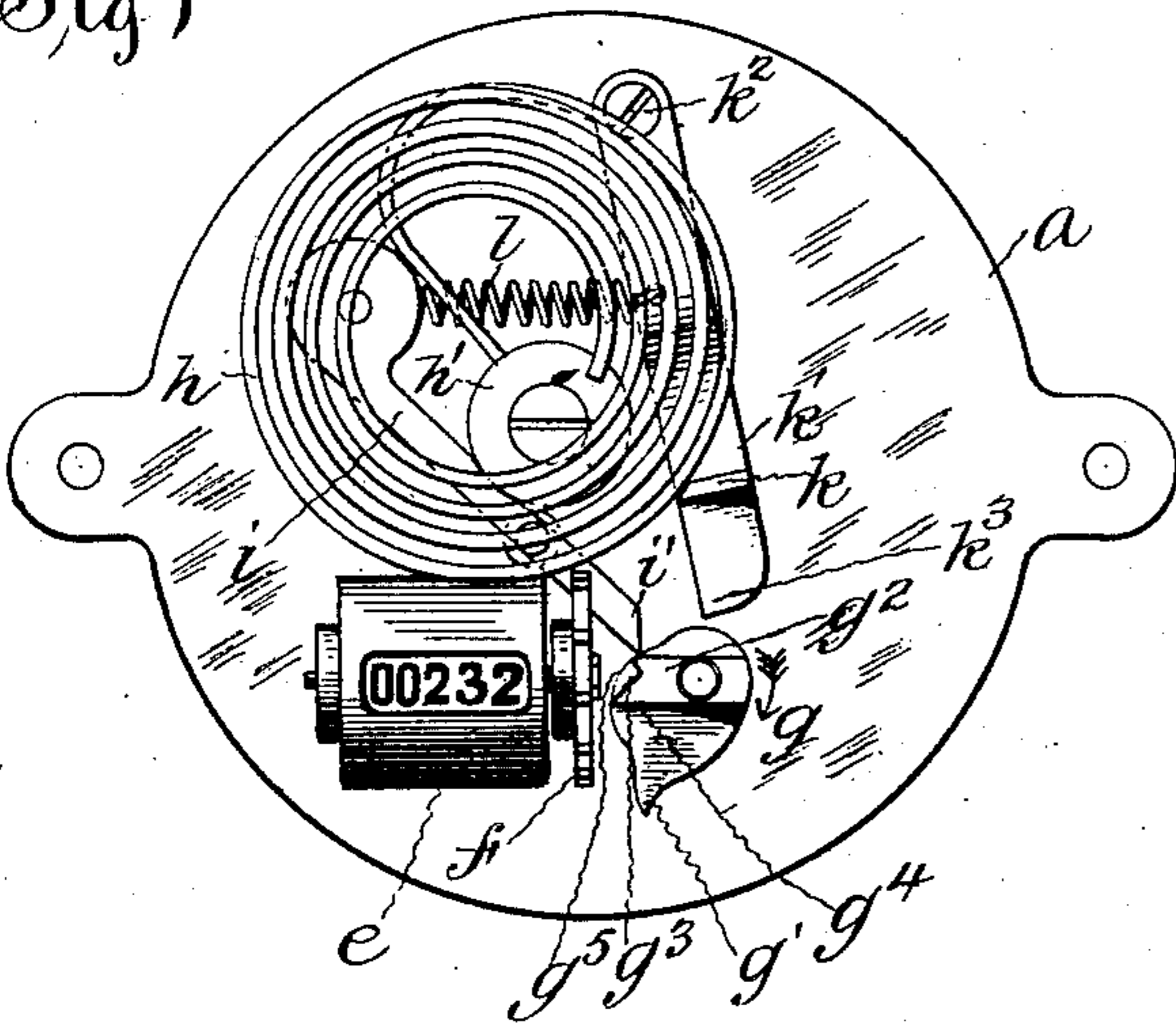


Fig 2

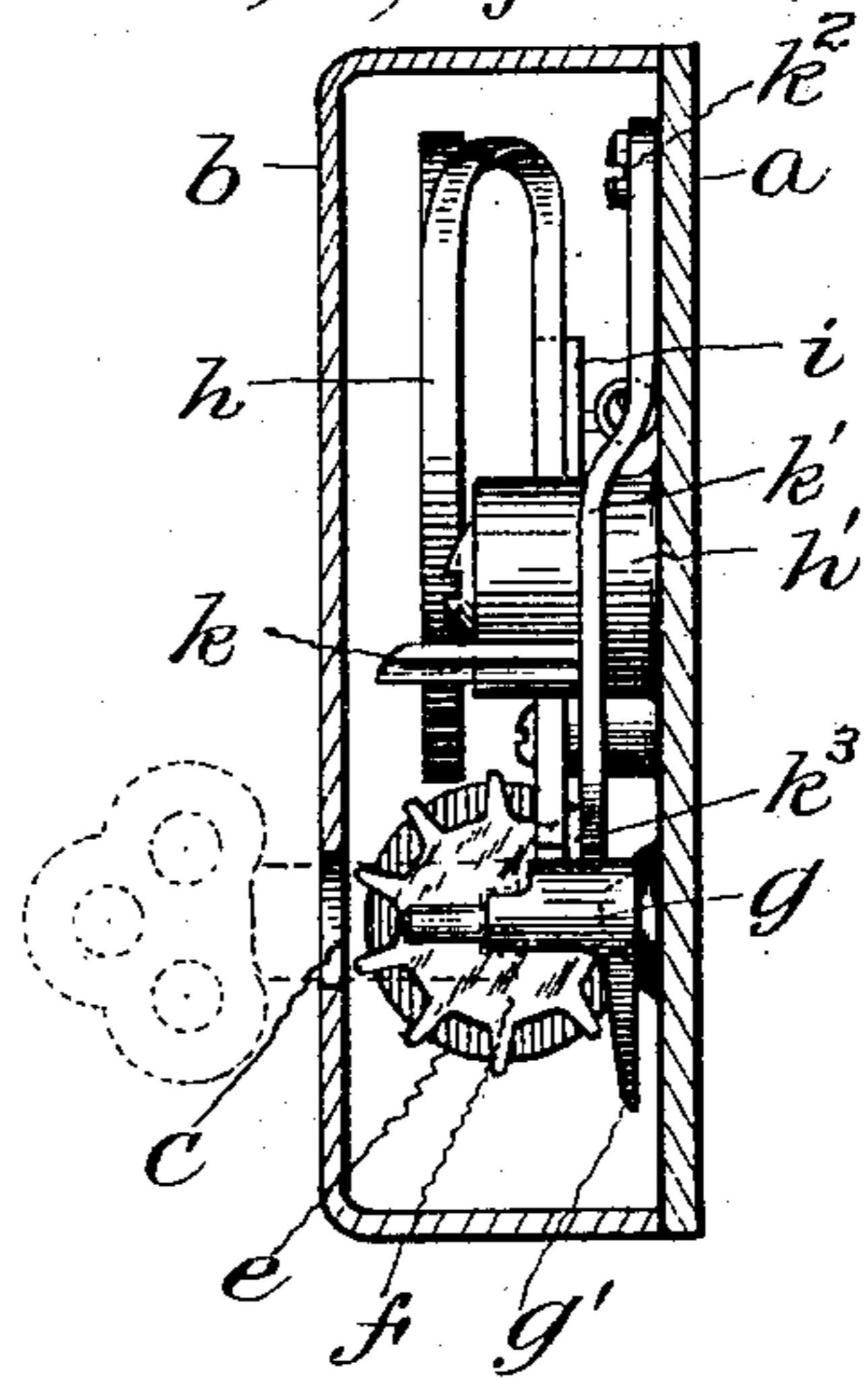


Fig 3

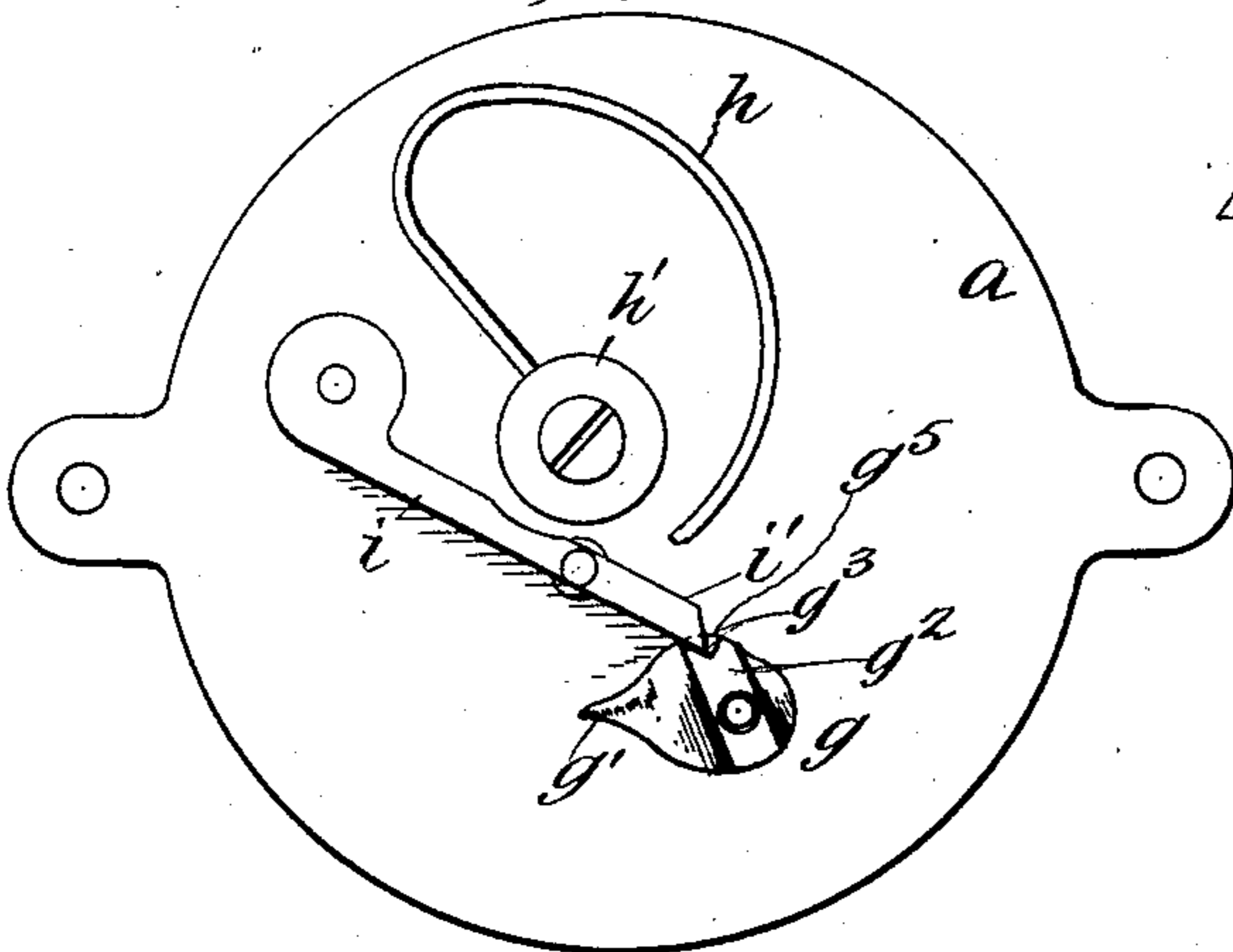


Fig 4

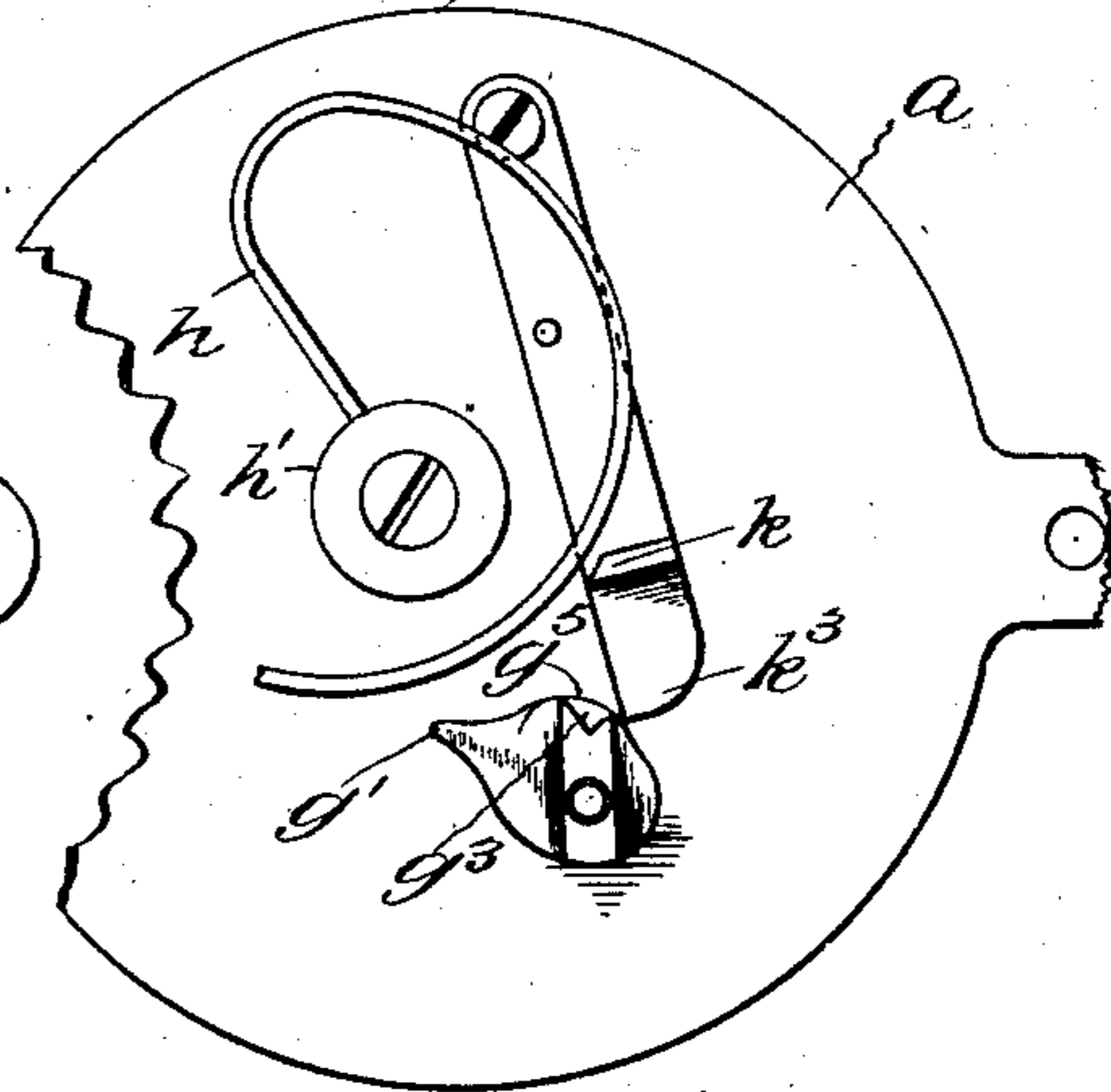
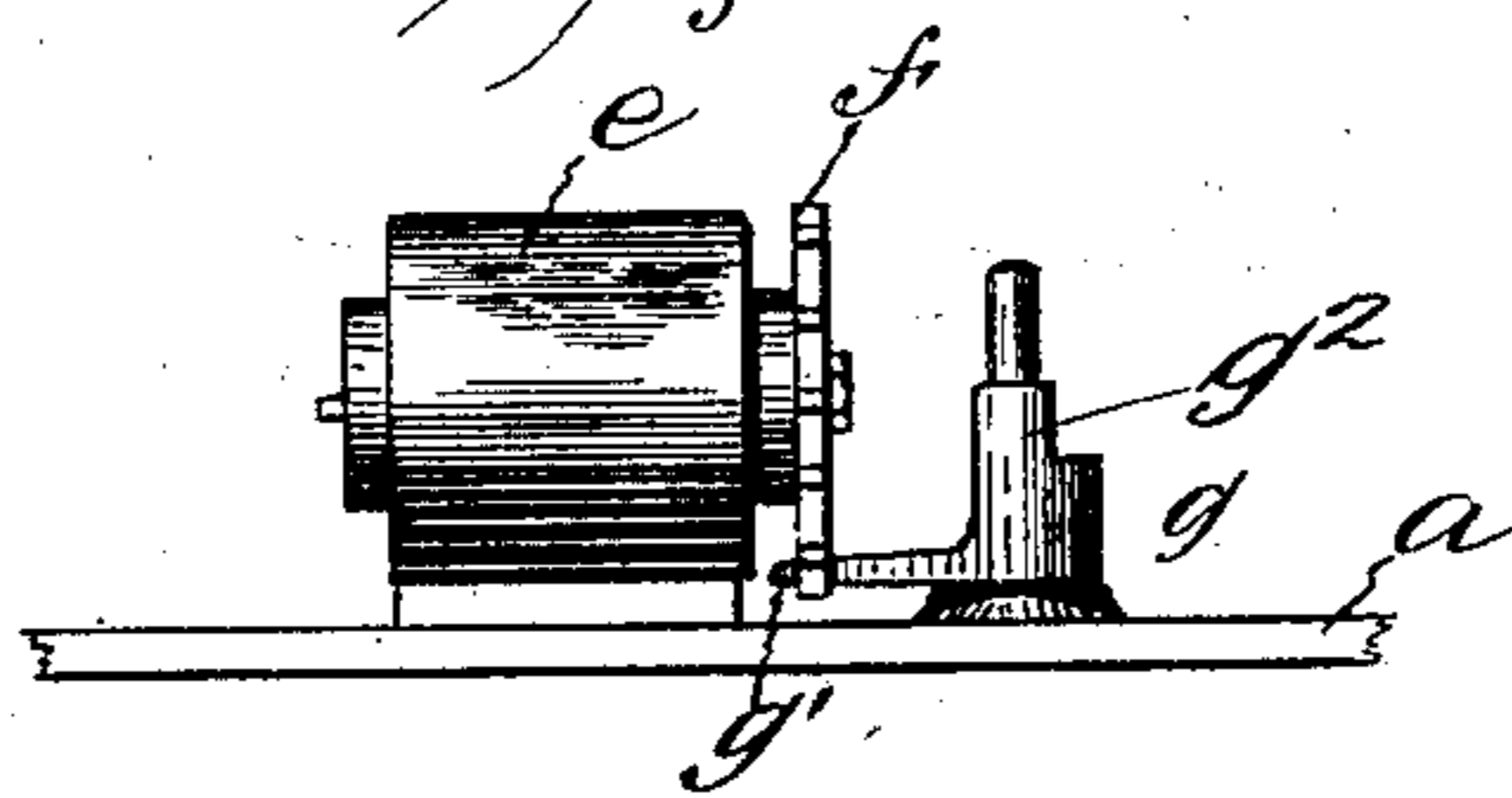


Fig 5



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UNITED STATES PATENT OFFICE.

GEORGE A. LONG, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE GRAY TELEPHONE PAY STATION COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

TELEPHONE TOLL-REGISTER.

SPECIFICATION forming part of Letters Patent No. 723,694, dated March 24, 1903.

Application filed November 21, 1901. Serial No. 83,174. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. LONG, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Telephone Toll-Registers, of which the following is a full, clear, and exact description, whereby anyone skilled in the art can make and use the same.

My invention relates to the class of devices which are used in connection with a telephone service for the purpose of enabling a so-called "measured" service to be provided. Under this system a subscriber is entitled to a certain number of calls in a given time and can secure telephonic connection with any other person on the line only by registering the call. To prove to the operator at the central office that the subscriber has registered the call, an alarm device is connected to the register in such manner that as the latter is operated the signal also is sounded. This enables the operator at the central office to control the measured service.

The object of my invention is to provide a telephone toll-register in which defects in prior structures are overcome and a simple, compact, and convenient device provided in which the gong or signal cannot be sounded except after a call has been registered and also one in which a reverse rotary movement of the tumbler is prevented.

Referring to the drawings, Figure 1 is a plan view of the device with parts in normal position of rest and with the casing removed. Fig. 2 is an edge view of the back plate and of the mechanism and showing the cover cut in section. Fig. 3 is a detail view showing the tumbler turned and the end of the hammer-lever in engagement with a stop to prevent reverse rotary movement of the tumbler. Fig. 4 is a detail plan view of the tumbler after tripping the hammer and in engagement with the muffer-lever. Fig. 5 is a detail edge view looking from the bottom and showing the tumbler and related parts in the position as in Fig. 4.

In the accompanying drawings the preferred form of my device is embodied, the parts being supported by a base *a* and sup-

plied with a cover *b*, having an opening *c* for the insertion of a key, and a window (not shown) through which the numbers on the register can be plainly seen.

On the base *a* is supported a register *e* of any convenient construction and arranged to display numbers in the ordinary manner. A star-wheel *f* is mounted on the shaft which operates the dials of the counter and so located as to be in the path of movement of a tumbler *g*, shown herein as a rotary member and having a finger *g'*, adapted to engage the star-wheel in the movement of the tumbler in such manner as to advance the dial a unit-space. A gong *h* or like signal device of ordinary construction is secured to a post *h'* on the base *a*, and a hammer-lever *i* is supported in operative relation to the gong and also to the tumbler, a projection on which encounters the tail *i'* of the hammer-lever in the operating movement of the tumbler. The tumbler *g* is actuated by a key or other suitable means and in the direction of movement (as indicated by the arrow in Fig. 1) essential to operate the register and the signal device, the trip *g²* encountering the end *i'* of the hammer-lever and moving the hammer away from the gong or bell and putting the spring *l* under tension. As soon as the trip *g²* has passed the end of the lever the latter returns under the recoil of the hammer-spring and sounds the signal. During this same movement of the tumbler the finger *g'* has engaged the star-wheel of the register and turned the dial-shaft one unit-space. The trip for actuating the hammer has a notch *g³*, which forms a lock by engaging the end *i'* of the lever when an attempt is made to reverse the movement of the tumbler before the alarm has been sounded, and back of that lock is another lock *g⁴*, mounted on the back of the trip, which is also engaged by the end of the lever when a reverse movement of the latter is attempted after sounding the signal. These locks prevent any reverse movement of the shaft of the register on which counter-dials are mounted and avoid damage to the parts which otherwise might result, and they also allow the use of a more delicate mechanism in the register and prevent it from being

injured by wrong or needless strains thrown upon them. In fact the tumbler is provided with a combined trip and lock which first engages the end of the hammer-lever and prevents backward rotation of the tumbler, then trips the hammer-lever, and subsequently prevents backward rotation of the parts.

The signal device (gong or bell) is required to warn the operator at the central office; but in some old forms of register and signal devices it has been possible to sound the signal without operating the register, this by striking on the signal-box. In my improved device that is prevented by muffling the gong and keeping it muffled in its normal condition of disuse. The muffler k is mounted on the base or on the frame and has a part held in contact with the gong h , except when moved out of contact by the movement of the tumbler or a part operated by such movement. The preferred form of muffler, and that shown in the drawings, includes a lever k' , pivoted to the base at k^2 with its end k^3 in the path of movement of a projection g^5 on the tumbler and forced toward the gong by a spring. In this case the hammer-spring l has one end fast to the hammer-lever and the other fast to the muffler-lever, so that the one spring serves the double purpose of actuating the hammer and the muffler; but this feature of the spring is not essential to my invention. The projection g^5 on the tumbler engages the muffler-lever so as to move the muffler out of contact with the gong before the recoil or striking movement of the hammer occurs and holds the muffler out of contact a sufficient length of time to enable a clear signal to be sounded, while permitting its return in time to prevent continuous vibration, which is objectionable for the reason that it interferes with the proper use of the line-wires for connections by drowning or confusing the vocal sounds. This return movement of the muffler into contact is caused by the continued rotation of the tumbler.

It will be noted that with the different members of the device in their normal position the hammer-lever is interposed in the path of movement of the teeth on the star-wheel of the register. As the tumbler is rotated this lever is first moved out of the path of movement of the teeth on the star-wheel and the finger g' on the tumbler engages the teeth on the star-wheel and moves the register forward one unit-space. The hammer-lever then comes in contact with the notch g^3 and prevents backward movement of the tumbler. A continued rotation of the tumbler causes the muffler to be moved away from the gong, and at the same time the hammer-lever is freed from engagement with the tumbler, when the hammer is actuated by the spring l to sound the gong. In this position the hammer-lever engages the stop g^4 and prevents backward movement of the tumbler in an advanced position. The continued rotation of the tumbler releases the muffler-lever, which is brought

into contact with the gong under the tension of the spring l . In this position the end of the muffler-lever is brought into contact with the stop g^4 and prevents backward movement of the tumbler.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a telephone toll-register, in combination with a base, a gong, a register, a rotary tumbler for operating the register, a hammer-lever and hammer operatively connected with the tumbler, and a gong-muffler operatively connected with the tumbler and adapted to muffle the gong during a predetermined rotation of the tumbler.

2. In a telephone toll-register, in combination with a base, a gong mounted on the base, a register mounted on the base, a rotary tumbler for operating the register, a hammer-lever and hammer operatively connected with the rotary tumbler, and a muffler connected with said tumbler and held out of engagement with the gong during a predetermined rotation of the tumbler.

3. In a telephone toll-register, in combination with a base, a gong mounted on the base, a register mounted on the base, a hammer, a muffler adapted to normally engage the gong, and a rotary tumbler arranged to operate the register and the hammer, and to retain the muffler from contact with the gong during a predetermined rotation of the tumbler.

4. In a telephone toll-register, in combination with a base, a gong and a register, a hammer adapted to sound the gong, a rotary tumbler arranged to operate the register, and a combined lock and trip having a synchronous movement with the tumbler and adapted to compel complete forward rotation of the tumbler upon engagement with the hammer-lever.

5. In a telephone toll-register, in combination with a base, a gong and a register, means including a tumbler for sounding the gong and for operating the register, and a hammer-lever operatively connected with the tumbler and adapted by connection therewith to prevent backward movement thereof.

6. In a telephone toll-register, in combination with a base, a gong and a register, a tumbler arranged to operate the register and to operate a hammer-lever, and the hammer-lever operatively connected with the tumbler and adapted by connection therewith to prevent backward movement thereof from different positions.

7. In a telephone toll-register in combination with a base, a gong and a register, a rotary tumbler provided with a combined trip and lock arranged to operate the register and a hammer-lever, said hammer-lever adapted to engage the combined lock and trip of the tumbler and compel complete forward registering movement thereof.

8. In a telephone toll-register, in combination with a base, a gong and a register, a muffler to engage the gong, a hammer adapted to

5 sound the gong, and a rotary tumbler to alternately engage and operate the muffler and the hammer to sound the gong for a predetermined period of rotation of the tumbler and to operate the register.

10 9. In a telephone toll-register, in combination with a base, a gong and a register, a muffler in normal engagement with the gong, a hammer to sound the gong, and a rotary tumbler to engage the hammer to sound the gong and to engage the muffler and release it from the gong during a predetermined rotation of the tumbler, and to operate the register prior to the movement of the hammer and muffler.

15 10. In a telephone toll-register, in combination with a base, a register and a gong, a hammer to sound the gong and a muffler to engage the gong, only at predetermined intervals during the rotation of the operating mechanism, an operating mechanism including a rotary tumbler having a register-finger, a cam and a hammer-trip arranged to successively operate the register, muffler and hammer during the complete movement of the operating mechanism.

25 11. In a telephone toll-register, in combination with a base, a gong and a register, a hammer to sound the gong, a muffler to engage the gong, a tumbler having a cam to engage and operate the muffler, a trip to engage and operate the hammer, a stop for engagement with the hammer to prevent backward movement of the tumbler, and a finger to operate the register.

35 12. In a telephone toll-register, in combination with a base, a gong and a register, a star-wheel operatively connected with the register,

ter, a hammer to sound the gong and adapted to normally engage the teeth of the star-wheel to lock the latter against movement, a muffler 40 to operate the gong, and a tumbler adapted to engage both the muffler and hammer to operate said parts, and a finger to engage and operate the star-wheel during the operation of the hammer.

45 13. In a telephone toll-register in combination with a base, a gong and a register, a star-wheel operatively connected with the register, a hammer to sound the gong having a hammer-lever arranged to fall between the teeth of the star-wheel upon sounding the gong to lock said wheel after a predetermined movement, a muffler to operate the gong, and a tumbler adapted to engage the muffler and hammer to operate said parts and provided 55 with a finger to engage and operate the star-wheel.

14. In a telephone toll-register, in combination with a base, a gong and a register, a hammer and hammer-lever for sounding the gong 60 and locking the register, a muffler to determine the period of vibration of the gong, a rotary tumbler provided with a finger for operating the register, means for actuating the muffler, and means for tripping the hammer 65 including a back-stop for preventing reverse rotation of the tumbler, said trip adapted to unlock the register-operating means during the movement of the hammer.

GEORGE A. LONG.

Witnesses:

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