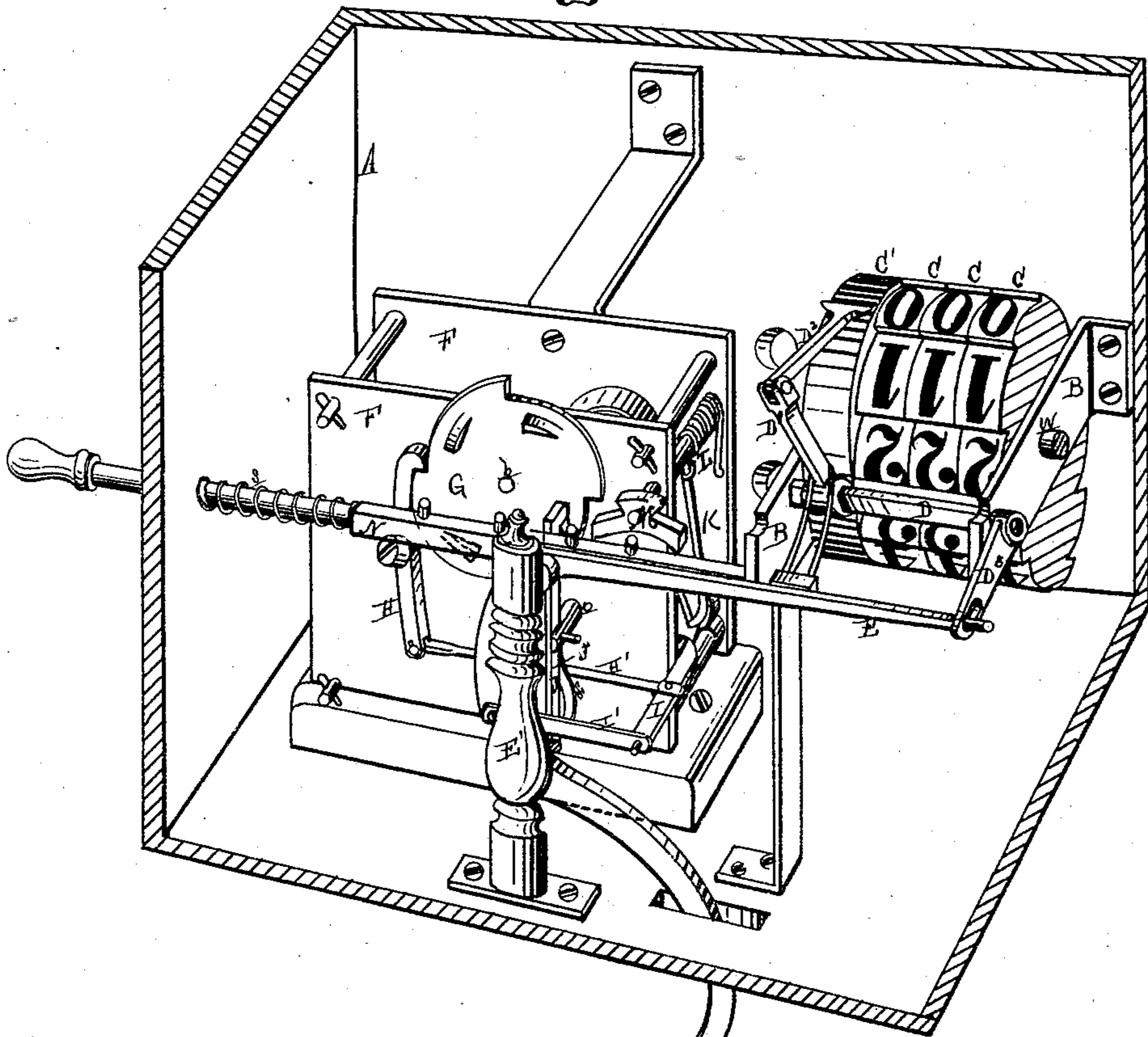


**J. O. ALLEY.**  
**Fire-Alarm Registers.**

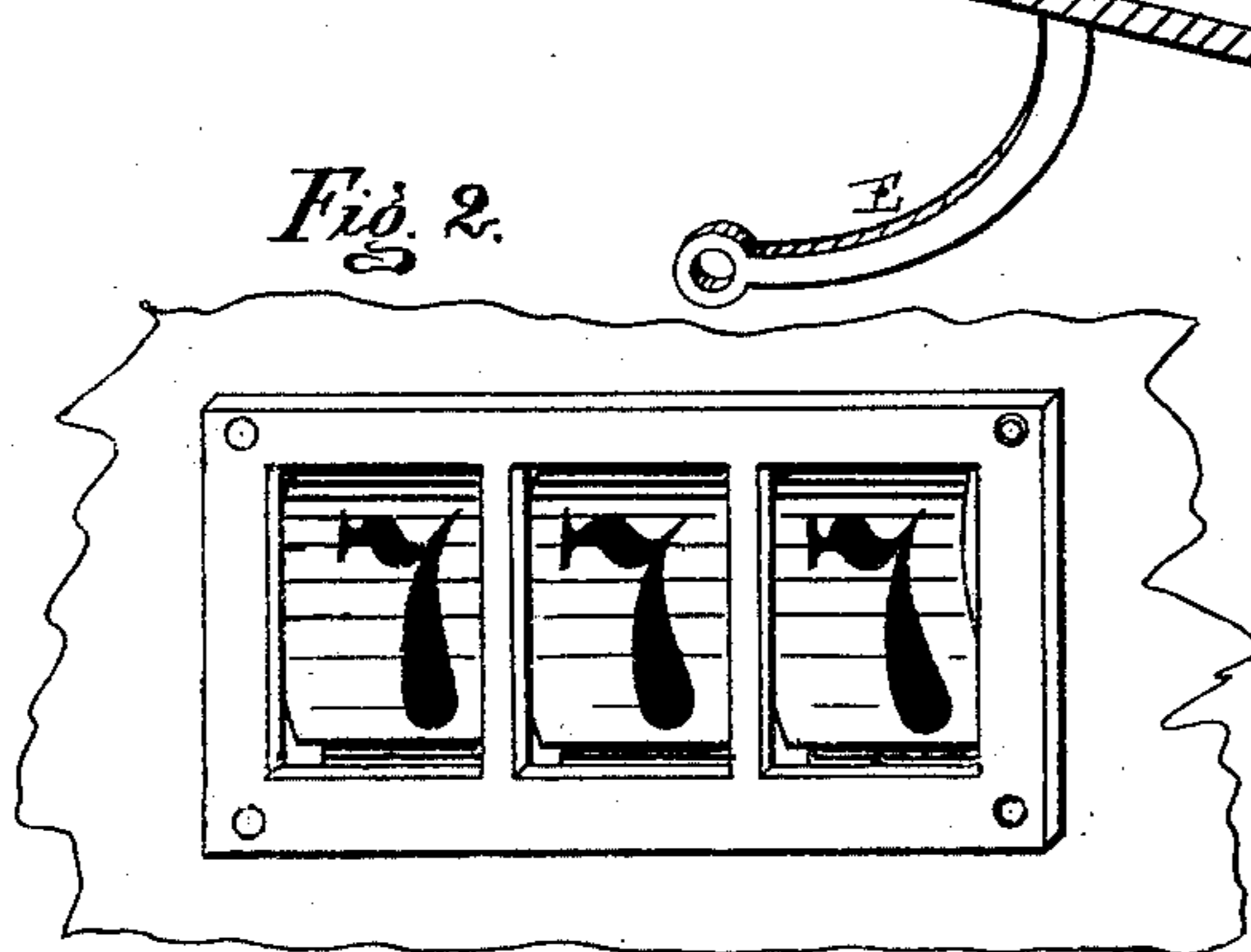
No. 156,114.

Patented Oct. 20, 1874.

*Fig. 1.*



*Fig. 2.*



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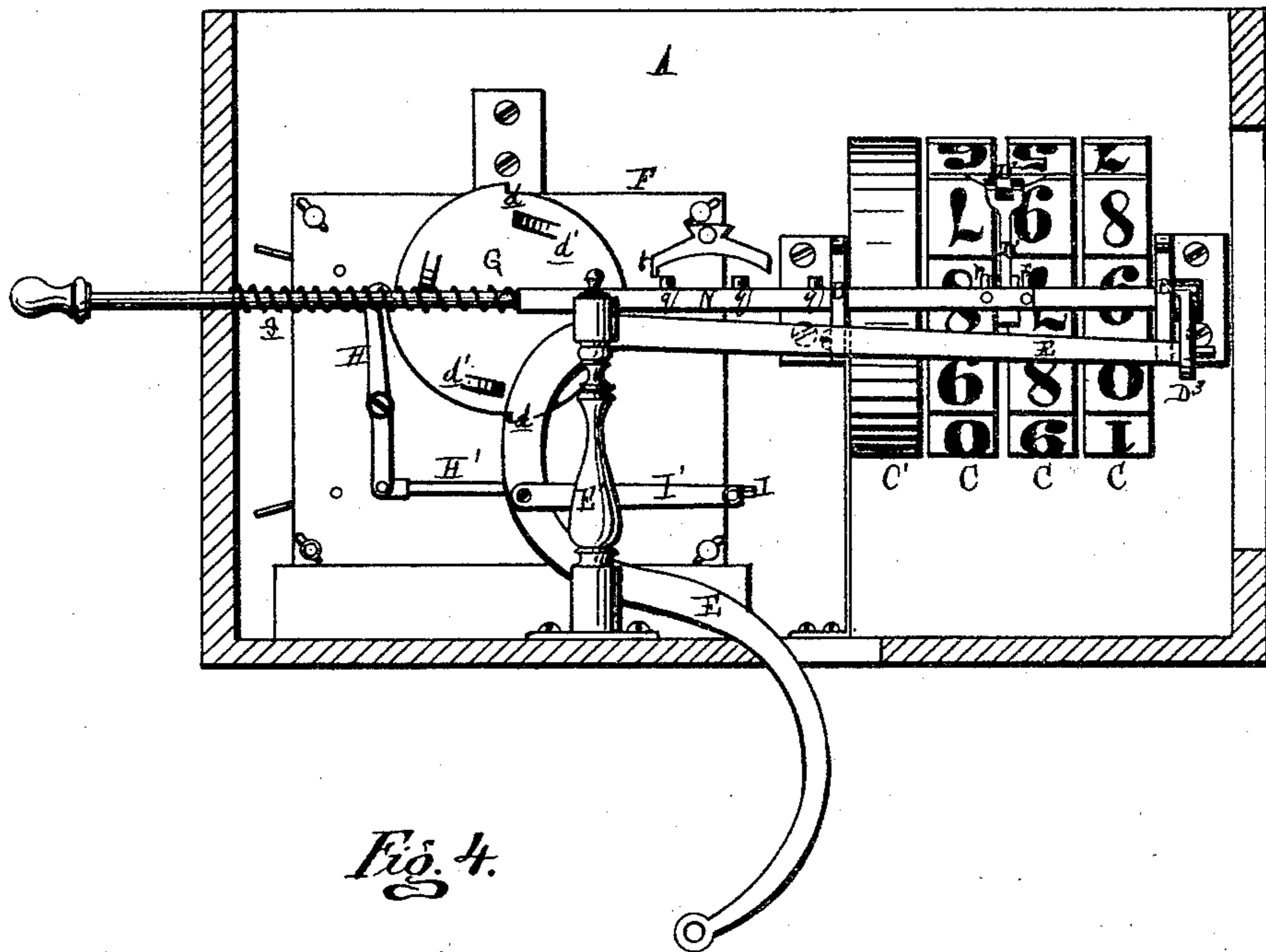
Inventor:  
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Phil S. Sprague

**J. O. ALLEY.**  
**Fire-Alarm Registers.**

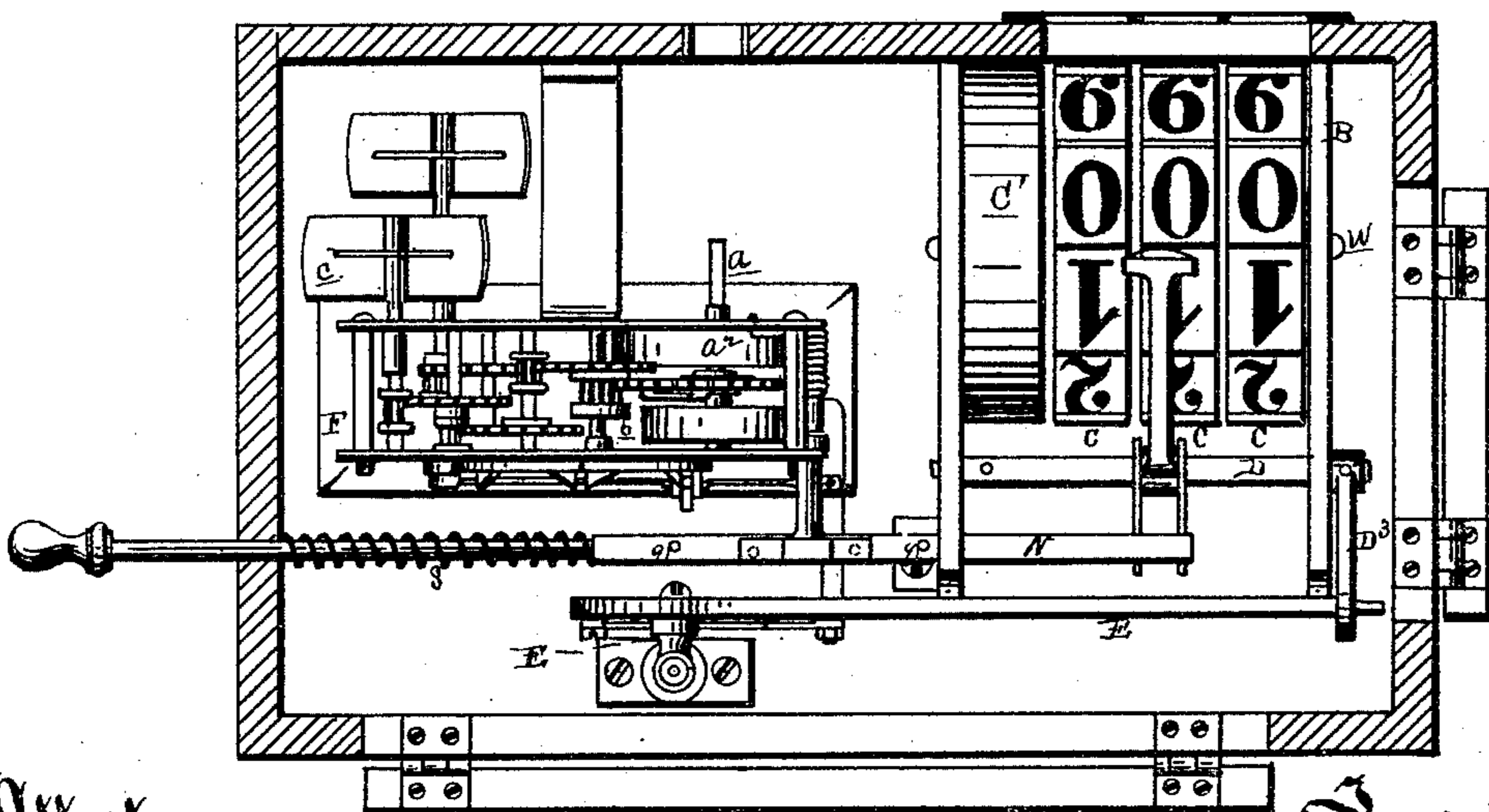
No. 156,114.

Patented Oct. 20, 1874.

*Fig. 3*



*Fig. 4.*



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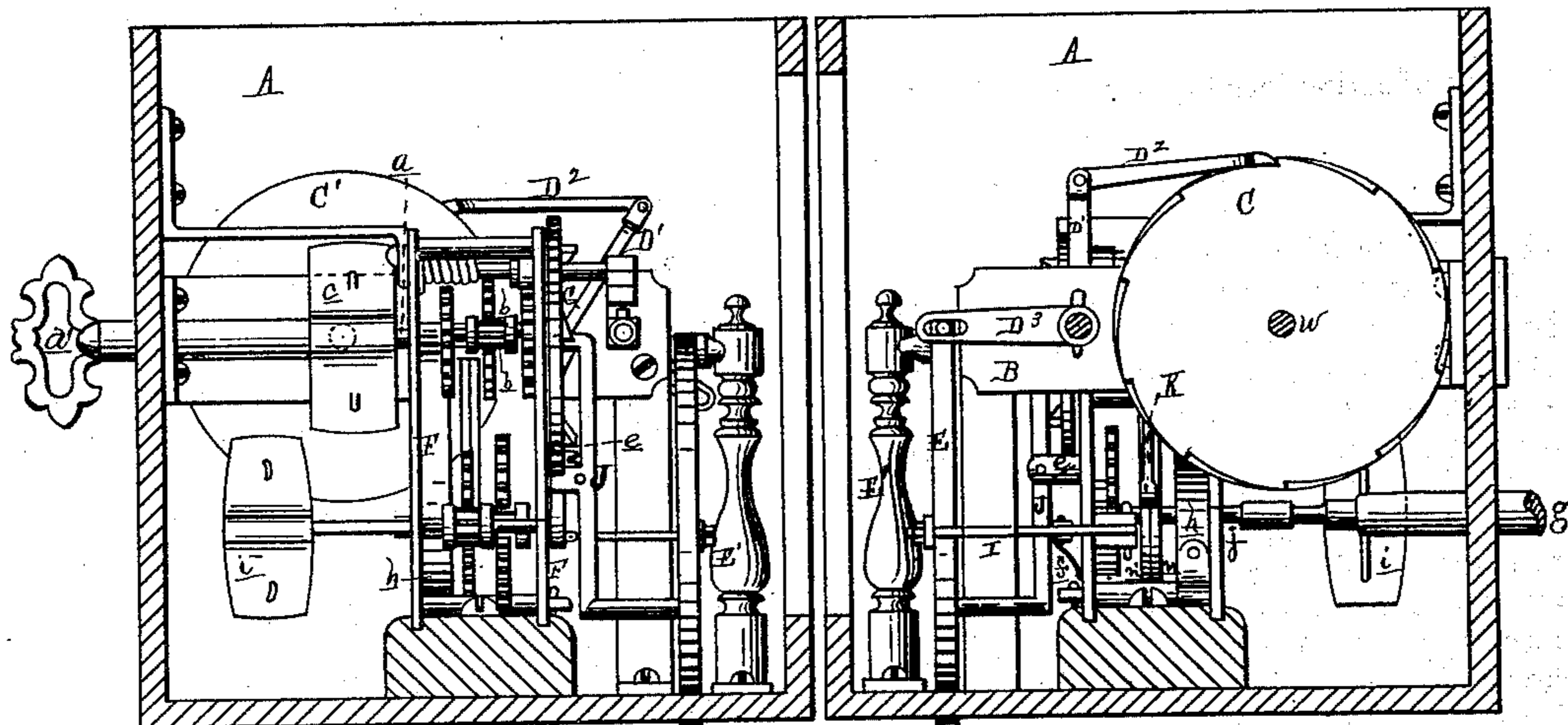
**J. O. ALLEY.**  
**Fire-Alarm Registers.**

No. 156,114.

Patented Oct. 20, 1874.

*Fig. 5.*

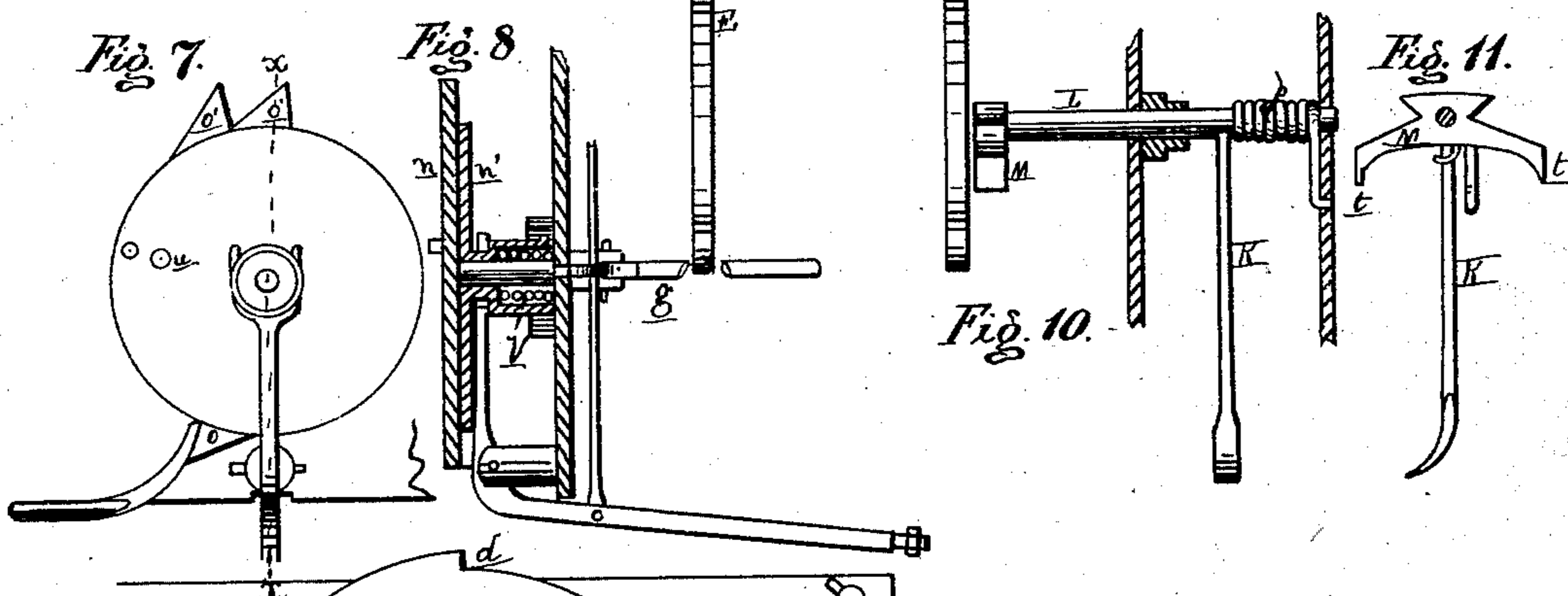
*Fig. 6.*



*Fig. 7.*

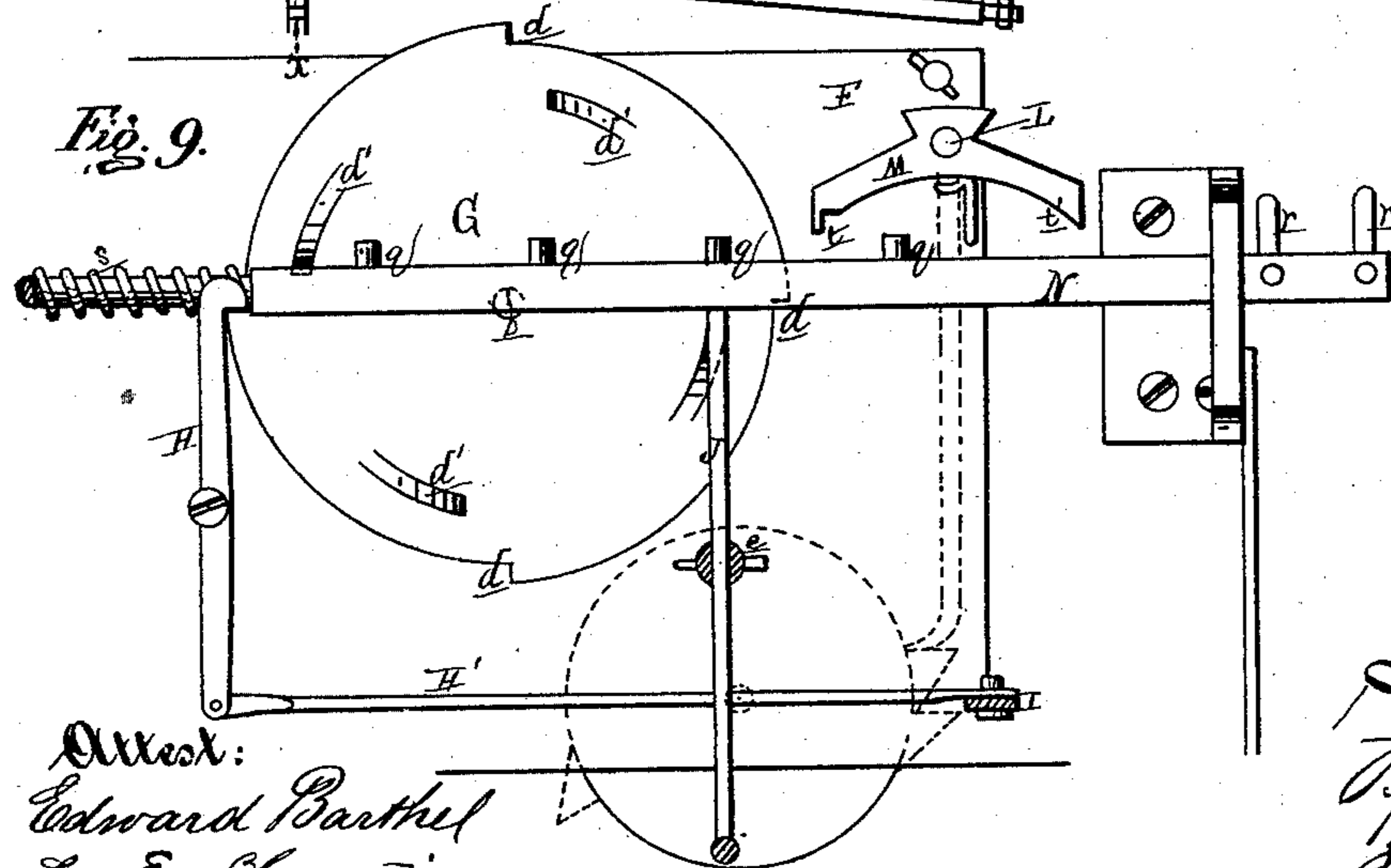
*Fig. 8.*

*Fig. 11.*



*Fig. 10.*

*Fig. 9.*



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# UNITED STATES PATENT OFFICE.

JOHN O. ALLEY, OF DETROIT, MICHIGAN.

## IMPROVEMENT IN FIRE-ALARM REGISTERS.

Specification forming part of Letters Patent No. **156,114**, dated October 20, 1874; application filed July 24, 1874.

*To all whom it may concern:*

Be it known that I, JOHN O. ALLEY, of Detroit, in the county of Wayne and State of Michigan, have invented an Improvement in Electro-Magnetic Fire-Alarm Annunciators, of which the following is a specification:

My invention has for its object to combine, with the alarm-gong of a fire-engine house, in municipalities having fire-alarm telegraphs, an annunciator, to be operated by the gong-hammer or some other part of the electro-magnetic signaling mechanism, for the purpose of indicating, at the first round struck, the number of the box or station from which the alarm is given; also, to prevent the confusion attendant upon double or recoil strokes of the hammer upon the gong, single strokes alone being recorded.

The invention consists in combining a counter actuated by the gong-hammer with a clock-work which will permit the counter to operate only at certain fixed intervals of time.

Figure 1, Sheet 1, is a perspective view of the instrument, looking at it from behind, the top, back, and one end wall being broken away to show it. Fig. 2 is an elevation of the glazed openings in the front of the casing, showing the counter-wheels behind it. Fig. 3, Sheet 2, is an elevation of Fig. 1. Fig. 4 is a plan of the instrument and a horizontal section of the casing at the plane of the glazed openings. Fig. 5, Sheet 3, is an elevation of the left-hand end of the instrument. Fig. 6 is a similar view of the right-hand end. Fig. 7 is an elevation of the detent-wheel of the main train. Fig. 8 is a vertical transverse section of the same at *x x*. Fig. 9 is a detail rear elevation of the tripping-wheel of the upper train, the shifter-bar of the counter-pawl, and its detent-pallet. Fig. 10 is a side elevation of said detent-pallet, its lever and spring. Fig. 11 is a detached rear elevation of the same.

In the drawing, A represents the casing of my instrument, across one end of which there is erected a pair of frame-bars, B, between which three ratchet-faced counter-wheels, C, are sleeved on a shaft, *w*, and at the right end of said shaft a plain wheel, C'. The wheels C have each ten ratchet-faces cut in its periphery, each face having an Arabic numeral

painted on it. The wheel C' is a trifle larger in diameter than the wheels C. In front of the counters glazed openings A' are made in the front of the case. Behind the counters a rock-shaft, D, is journaled in the bars B. It is square in cross-section, and on it is sleeved an arm, D<sup>1</sup>, to whose upper end is pivoted a pawl, D<sup>2</sup>, which rests on the wheels C or C'. At the projecting left-hand end of the rock-shaft there is secured thereto a rocker-arm, D<sup>3</sup>, having a slot in its end, in which is inserted one end of a bent lever, E, pivoted at its angle to a post, E', in the bottom of the casing. The lower end of the lever E plays through a slot in the bottom of the casing, and may be connected, by a link or otherwise, with the hammer handle of the alarm-gong, so that said lever may be raised at each stroke of the hammer, and, in turn, give the pawl a forward impulse, which will move forward the wheel C, upon which it may then rest. When the lever E drops the pawl recedes one notch upon the wheel C, and, upon the lever being again raised, will move forward the counter another notch.

From causes not necessary to recite it is found, in practice, that the gong-hammers frequently give double or recoil strokes upon the gongs, causing confusion. It will therefore be evident that, if some means be not taken to prevent it, the pawl will give an impulse or forward movement to the counter for each one of such double or recoil strokes.

In the construction of the fire-alarm apparatus now in use, most generally it is customary to give a pause of three seconds between single strokes, seven seconds between numbers, and fourteen seconds of time between the rounds or series of each alarm.

My first object is, then, to prevent the lever E from dropping back for a period of two seconds after each stroke, thus escaping the effect of a double stroke if one has been given; and my next object is to shift the pawl from one wheel to the next as soon as six seconds of time have elapsed from the last stroke given, and, upon completion of the round, to shift the pawl onto the periphery of the smooth wheel, when it can no longer actuate the counters. These I accomplish by or through a

double train of clock-work mounted in the frame-plates F, secured to the bottom of the casing.

The upper train governs the retraction of the counter-pawl; and it consists essentially in a main shaft, *a*, journaled through both frame-plates F, squared at one end to receive a winding-key, *a*<sup>1</sup>, Fig. 5. It has one end of a coil-spring, *a*<sup>2</sup>, secured to it, the other end being secured to a cross-bar of the frame, with a suitable click and click-spring to transmit the power of the spring to the said shaft *a*, which is geared to a second shaft, *b*, on the back end of which is mounted a disk, G. The shaft *b* is geared with any number of others in the train, the last one carrying a fly, *c*, which is adjusted to allow the disk G and its shaft to rotate once in eight seconds. There are four equidistant catches, *d*, in the periphery of said disk, with any of which a hooked bar, H, may engage, said bar being pivoted to the back plate of the train-frame, its lower end being connected, by a rod, H', with a bent lever, I, whose angle is pivoted to a stud between the plates at their left end, the inner end terminating in a clutch-yoke. The outer end of the lever I is connected with the pendent arm of the lever E by a link, I'. The hooked bar H serves as a stop-motion for the upper train, which is released each time the lever E is raised by the gong-hammer. On the face of the disk G there are four equidistant cam-projections, *d'*, which revolve in the path of the head of an L-shaped detent-bar, J, pivoted in a slotted stud, *e*, on the back plate, its lower end protruding into the wake of the bent part of the lever E when thrown out by a spring, *f*, Figs. 1 and 6.

When the lever E is raised by a stroke of the hammer the hook at the head of the bar H is withdrawn from a catch, *d*, and releases the upper train, which is then set in motion by its spring, the disk G making a quarter-revolution before being again arrested by the bar H. As soon as the lever G lifts, the heel of the lever J is thrown out under it by the spring *f*, and thus prevents the said lever from dropping down far enough to retract the pawl on the counter-wheel to shift it back into the next notch until two seconds of time have elapsed, when a cam, *d'*, comes into contact with the head of the lever J, pushes it out, and withdraws the heel of said lever from underneath the lever E, which then drops down, ready for another stroke, and at the same time shifts back the pawl a full notch on the counter. During the two seconds in which the lever E is held up the double or recoil stroke is given, if at all, and consequently the pawl will not move the counter. The function of the lower train is to shift the pawl from one ratchet-wheel to the next whenever seven seconds of time have elapsed between strokes of the gong-hammer. The main shaft *g* of the lower train is journaled through the frame-plates, and is squared on the front end to receive a wind-

ing-key, *g'*, Fig. 6. It has one end of a coil-spring, *h*, secured to it, the other being secured to a girt in the frame-plates. The shaft *g* is geared to the rest of the train, the last shaft carrying a fly, *i*, which is adjusted to allow the shaft *g* to make a revolution in sixteen seconds. On the shaft *g* there is keyed fast a disk, *n*, with a socket in its face, which receives a pin on another disk, *n'*, Figs. 6, 7, and 8, whose hub is sleeved on said shaft. This disk *n'* has a tooth, *o*, on its periphery, and nearly opposite it two other teeth, *o'*. A tripping-lever, K, pendent from a rock-shaft, L, journaled through the frame-plates, has its lower end kept in contact with the peripheries of the disks *n* *n'* by a spring, *p*, on said rock-shaft. At the back or overhanging end of said rock-shaft is a detent-pallet, M, directly over a shipper-bar, N, which slides in a bearing in the inner frame-bar B, and through the right end of the casing, and which shipper-bar has four equidistant studs, *q*, Fig. 9, on its upper surface, spaced a distance equal to that from one number-wheel center to the center of the next. The inner end of the said bar has two rods, *r*, which embrace the hub of the pawl-arm and slide it on its rock-shaft. A spring, *s*, spirally coiled about the shipper-bar, to the right of the studs, tends to pull the said bar to the right, while the spring *p* tends to keep the pallet *t* of the detent M down on the bar and arrest its movement to the right by catching one of its studs. The inner end of the bent lever I is forked and engages with an annular groove in the hub of the disk *n'*, and when the primary lever E is dropped to its normal position this lever I slides the disk *n'* toward the disk *n*, which carries it around until a pin, *u*, on its back surface, is arrested by the arm of said lever I, when the entire train is stopped. In carrying around the said disk *n'* in this manner a spring, *v*, is connected therewith, which is weaker than the mainspring *h*. When the primary lever E is raised by the gong-hammer in striking a blow the train is released and the disk *n'* unclutched from the disk *n*. At the same time the spring *v* instantly throws the said disk around on the shaft until the pin *u* is on the under side of the lever I, and when the lever E drops again the loose disk clutches again with the fast one, the operation being repeated each time a stroke is made, provided the strokes are not more than six seconds apart, which strokes actuate the first number-wheel, it being understood that the shipper-bar has been pushed in and held by the detent-pallet with the pawl resting on the first (or left) number-wheel, showing zero at the glazed opening. Six seconds having elapsed after one or more strokes have been made, and the number-wheel correspondingly actuated, the tooth *o* in the rotation of the disk *n'* passes in contact with the tripping-lever K and lifts the detent-pallet *t* from behind the first stud, *q*, letting the shipper-bar slip to the right, being

caught for an instant by a pallet, *t'*, at the other end, until the spring *p* can depress the pallet *t* again to catch the next stud, *q*, and hold the bar, the pawl being now opposite the center of the second number-wheel. Here the operation is repeated, and after one or more strokes have been made and recorded the pawl is in like manner shifted to the third number-wheel, as soon as six seconds have elapsed after the last stroke. When fourteen or fifteen seconds have elapsed after a stroke has been made and indicated, the two teeth *o'* come under the tripping-lever and free the shipper-bar, so that its spring will move its studs past the detent and shift the pawl onto the blank-wheel *C'*, when the numbers of the "round" or alarm may be struck again and repeated as often as may be necessary without setting the trains in motion. In this manner the number of the box from which an alarm

is sounded is indicated at the first round struck, without the possibility of mistake from double or recoil strokes of the gong-hammer.

I do not wish to be confined to the particular construction of clock-work shown, as it is evident that it is susceptible of various modifications without departing from the spirit of my invention.

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

The combination of a counter or register actuated by a clock-work controlled by the gong-hammer or other mechanism of a fire-alarm telegraph, with a clock-train which will permit the said counter to operate at fixed intervals of time, substantially as described.

JOHN O. ALLEY.

Witnesses:

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H. S. SPRAGUE.