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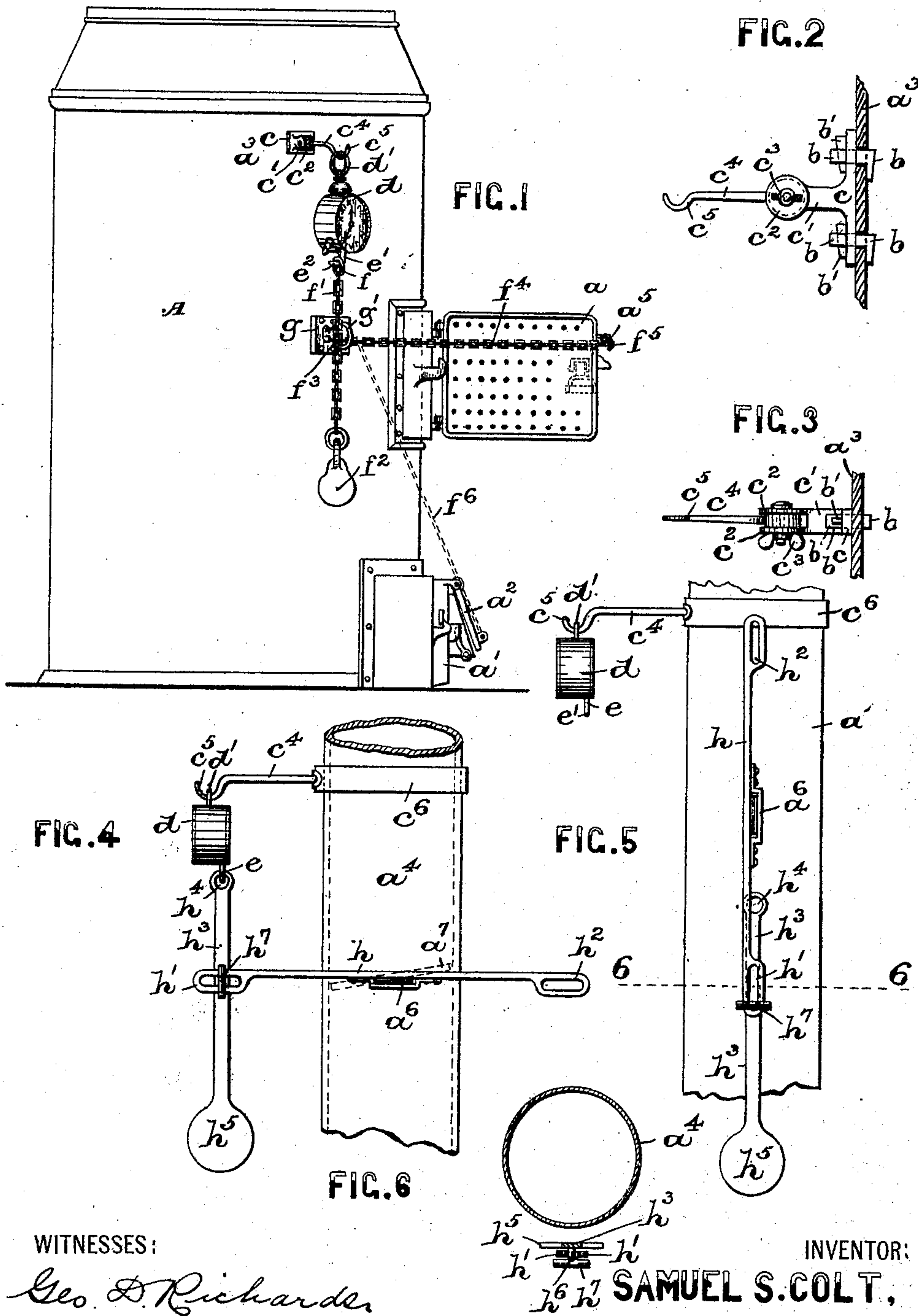
Patented Jan. 7, 1902.

S. S. COLT.
TIME DAMPER MECHANISM.

(Application filed Dec. 30, 1899.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

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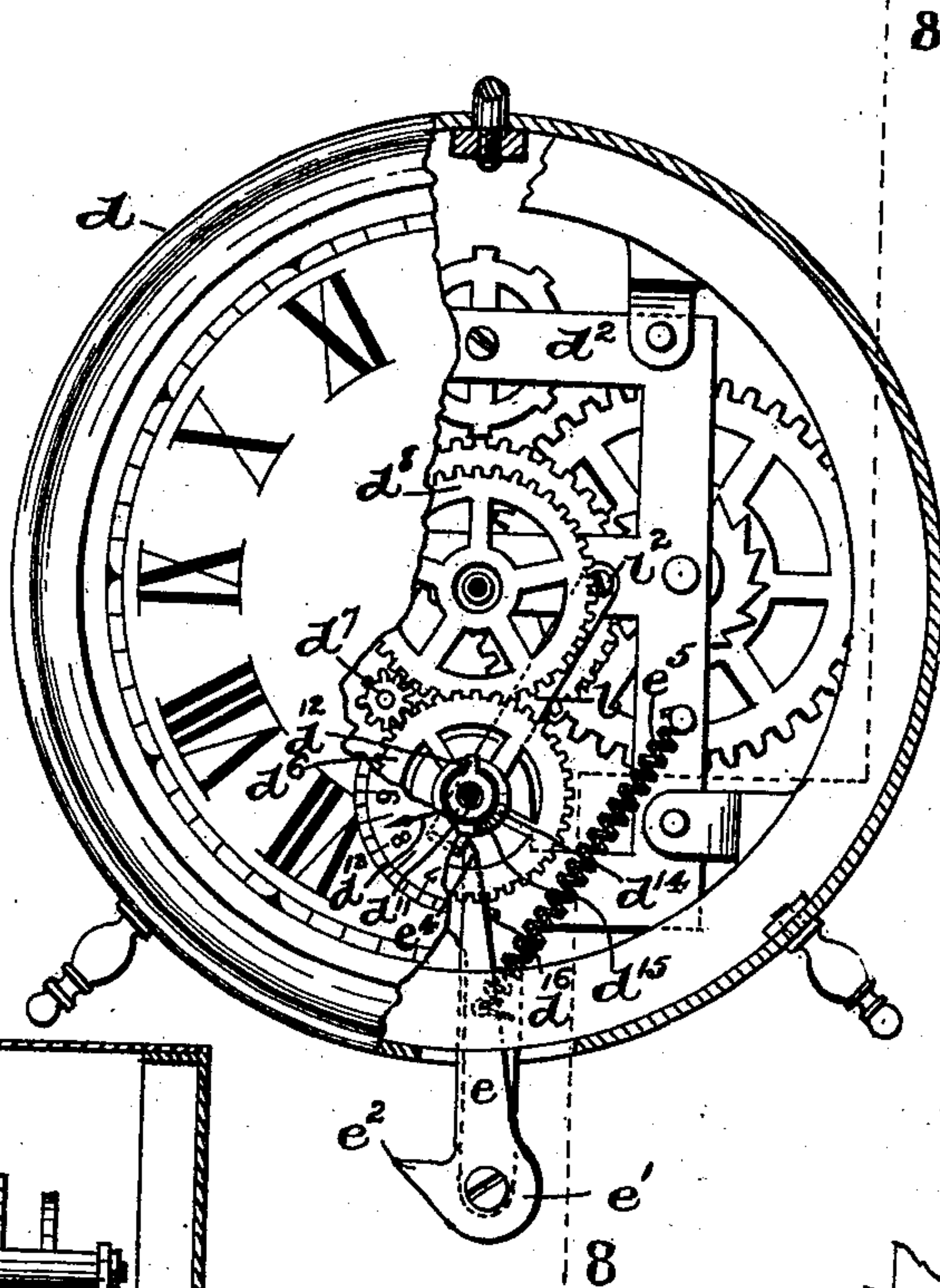


FIG. 7

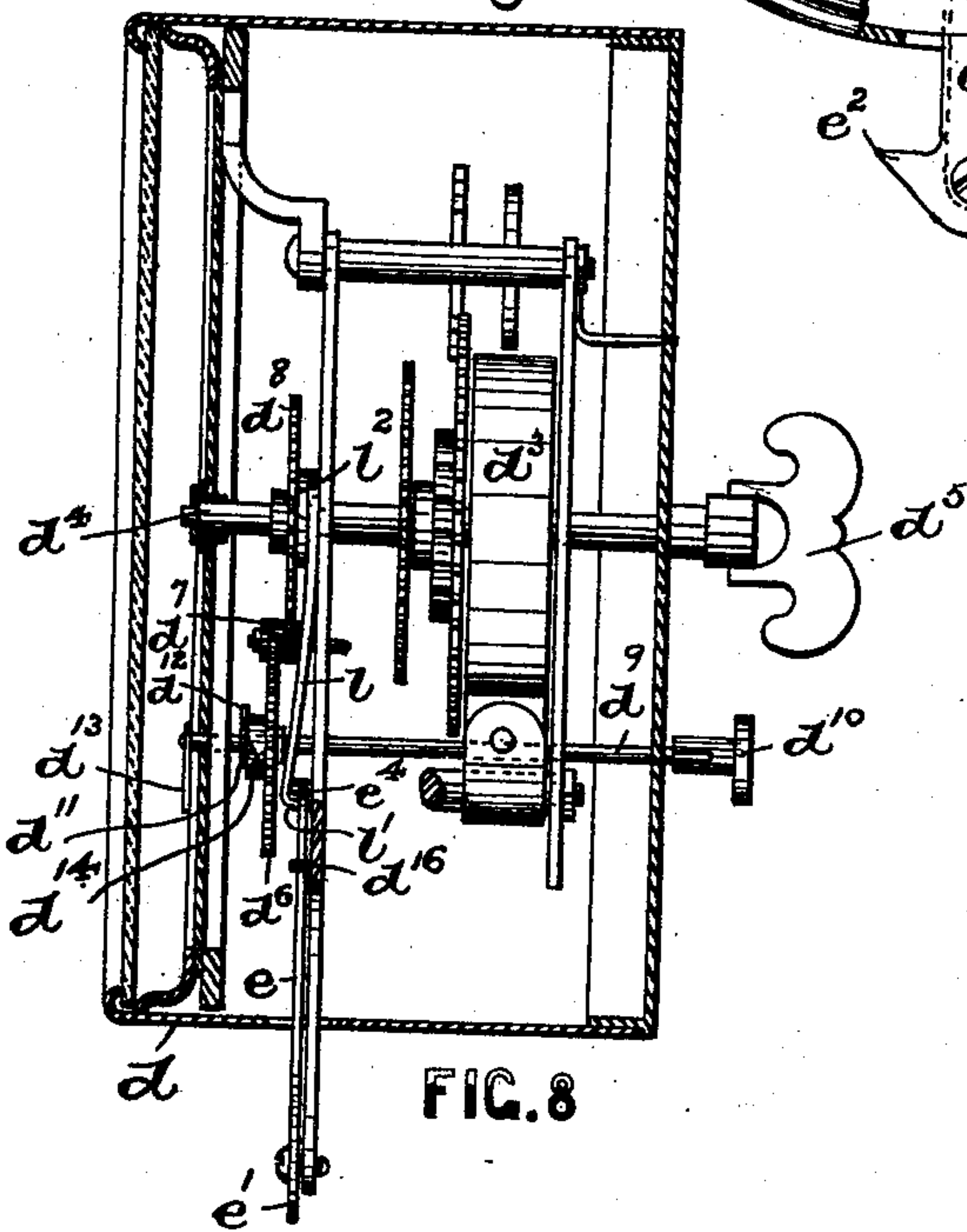


FIG. 8

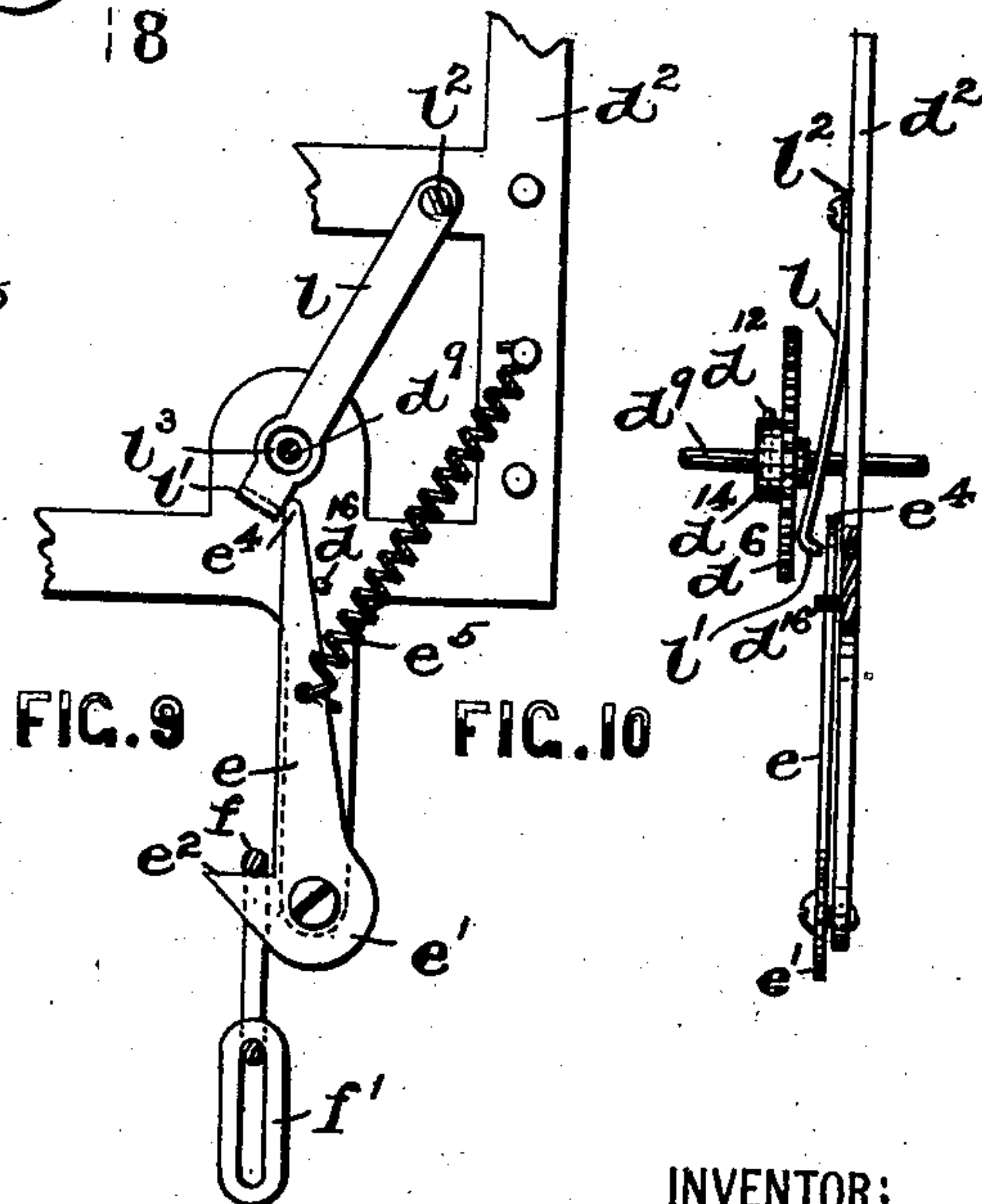


FIG. 9

FIG. 10

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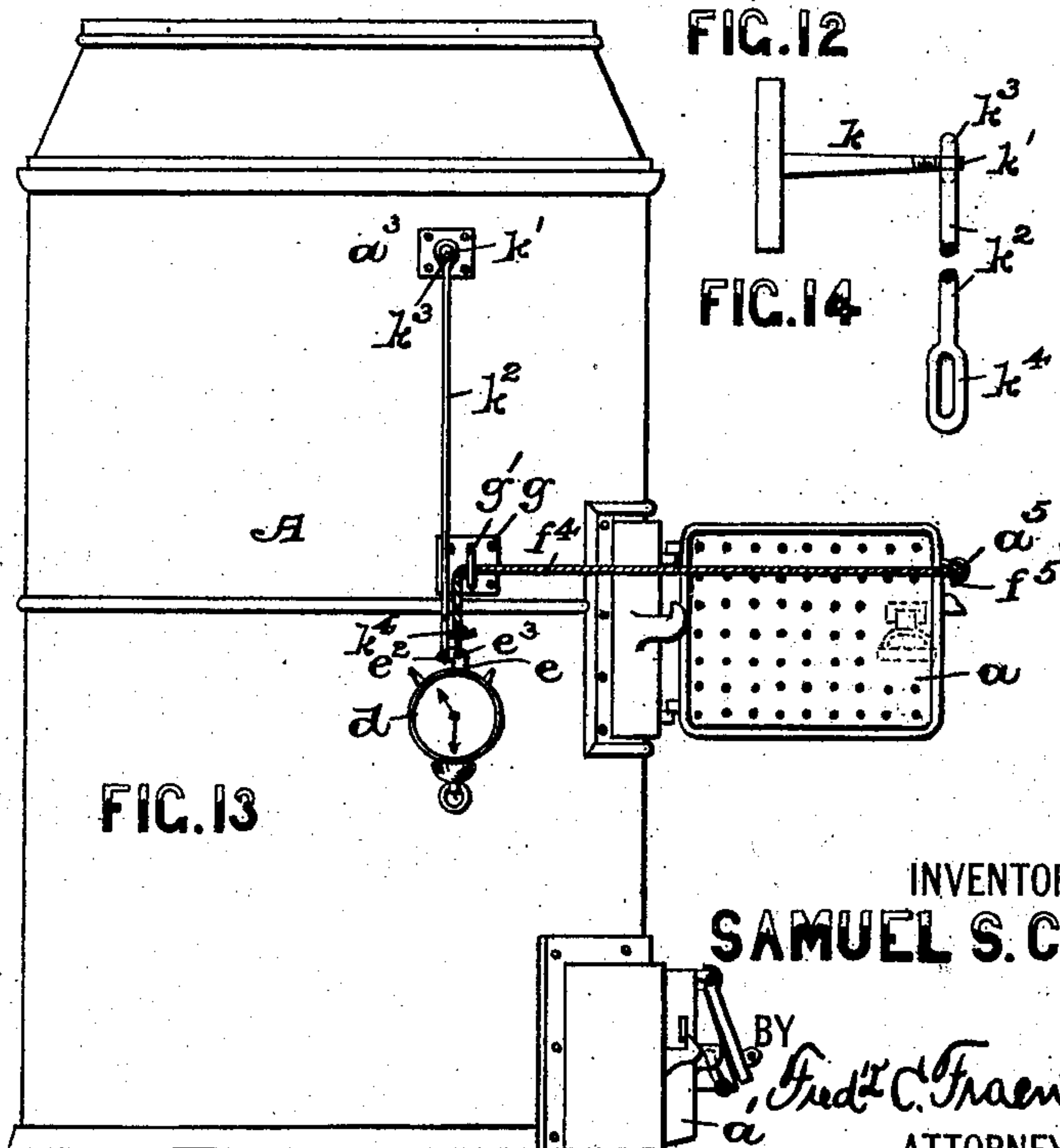
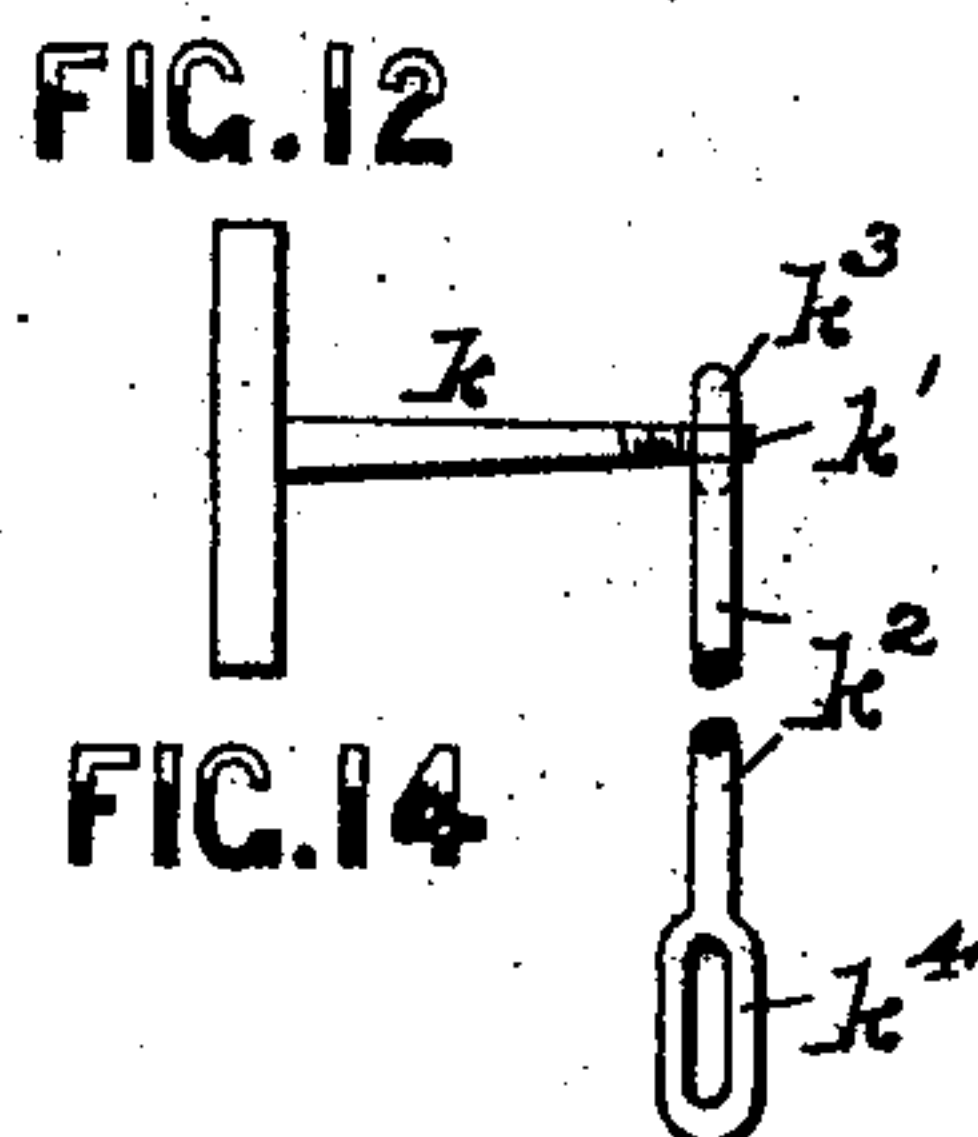
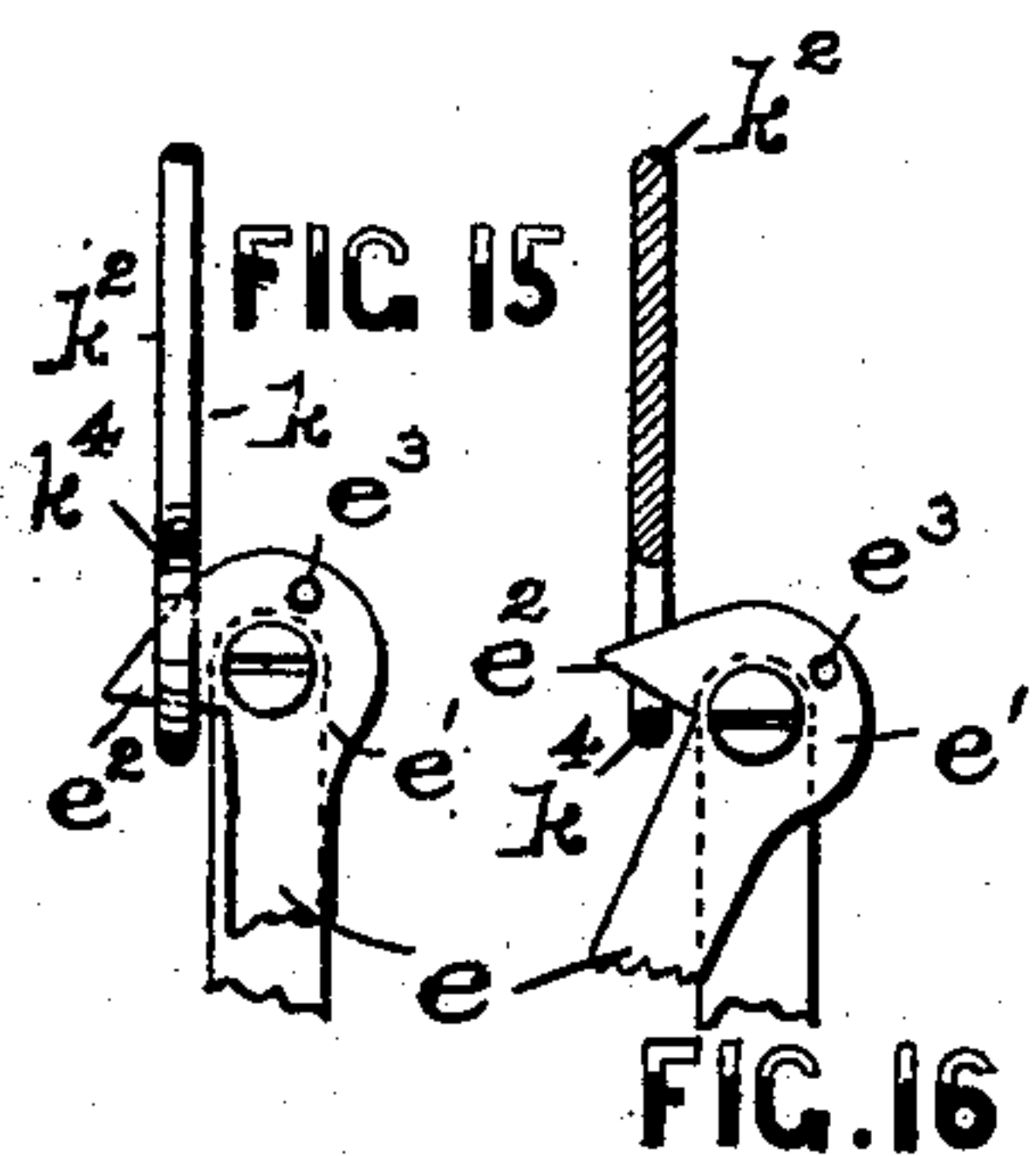
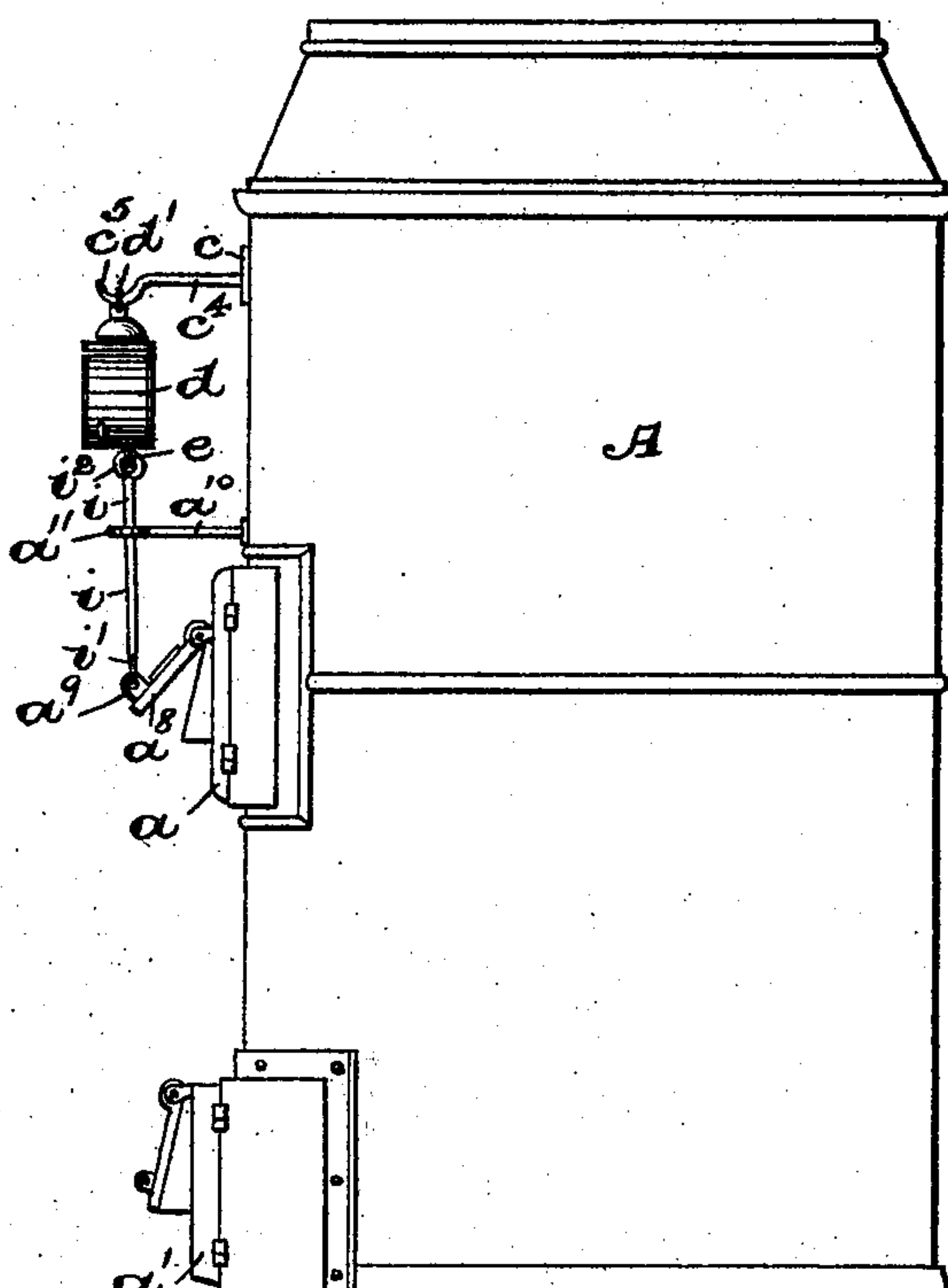
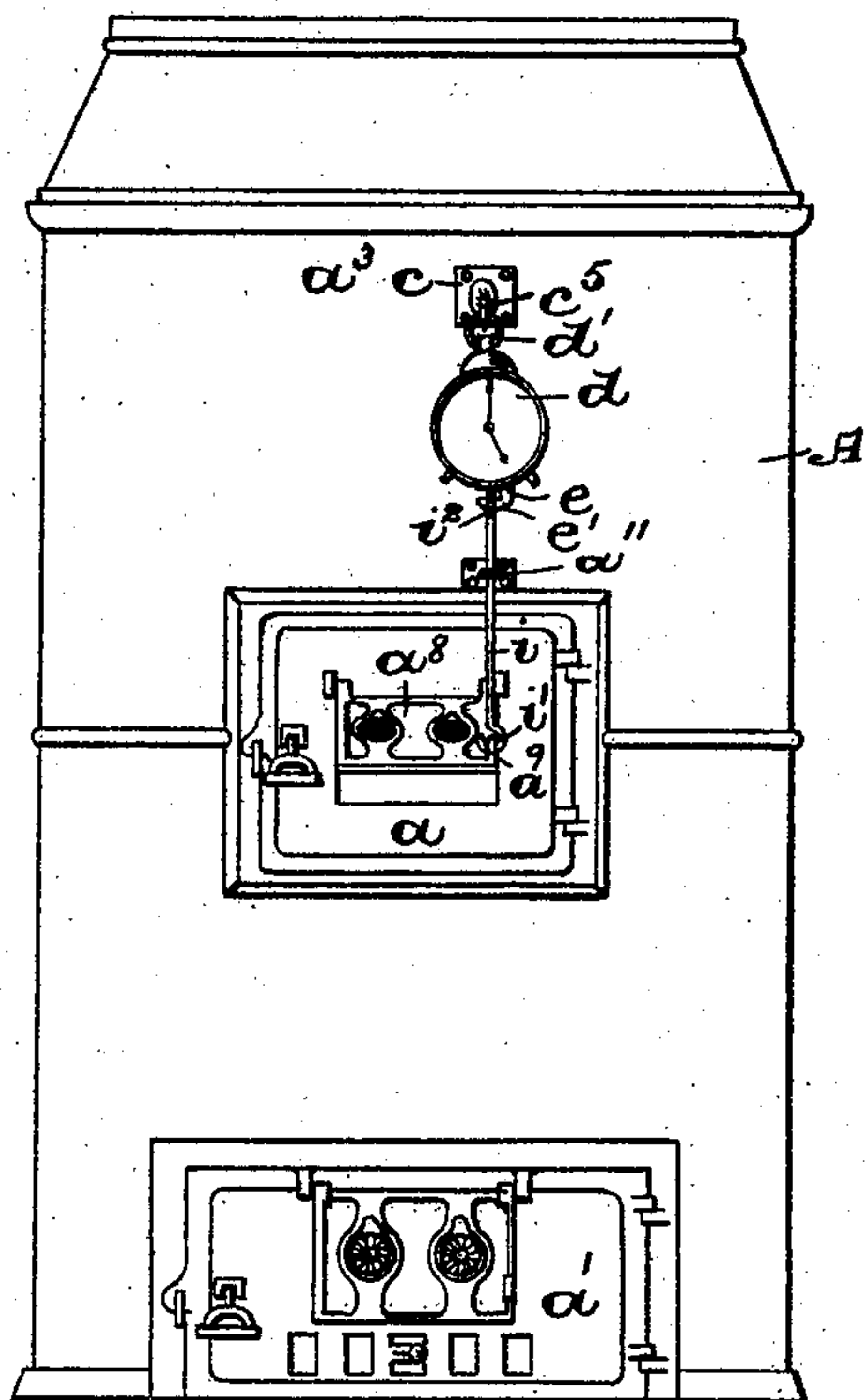
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

SAMUEL S. COLT, OF ORANGE, NEW JERSEY.

TIME DAMPER MECHANISM.

SPECIFICATION forming part of Letters Patent No. 690,637, dated January 7, 1902.

Application filed December 30, 1899. Serial No. 742,026. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL S. COLT, a citizen of the United States, residing at Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Door and Damper Operating Mechanism for Heaters, Furnaces, Ranges, &c.; and I do hereby 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 letters of reference marked thereon, which form a part of this specification.

My present invention relates to a novel door or damper regulating mechanism for furnaces, ranges, stoves, or heaters of the various kinds for automatically closing a door or opening a damper connected with the heating apparatus at any predetermined time to regulate the draft and permit the fire to burn up brightly without the necessity of going into the cellar to open up the dampers and doors of the heater before putting on the usual supply of fresh coal.

The invention therefore has for one of its principal objects to provide a novel mechanism which can be set for automatically operating at any predetermined time the door or dampers of a furnace, stove, range, or other suitable heater.

A further object of this invention is to provide in connection with the furnace, range, or other heater, and preferably detachably connected therewith, a timepiece for automatically releasing the door or damper operating means, and, furthermore, to provide a novel and simple operating means to be employed directly with a clock mechanism which shall be quick and reliable in its operations for releasing the door or damper operating mechanism.

My present invention therefore consists in the novel door or damper operating mechanism for furnaces, stoves, ranges, or heaters of the various kinds and also in the several novel arrangements and combinations of the various parts, as well as in the details of the construction thereof, such as will be hereinafter fully set forth, and finally embodied in the clauses of the claim.

The invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of one construction of heating apparatus provided with one form of door or damper operating means and a timepiece detachably connected with the side of the apparatus for releasing said door or damper operating means, all embodying the principles of my present invention. Figs. 2 and 3 are a side and top view, respectively, of an adjustable bracket for supporting the timepiece employed with the door or damper operating means. Figs. 4 and 5 are two side views of an operating means made according to the principles of this invention when employed in connection with a damper in a pipe, such as is used in heaters, that shown in the drawings representing the smoke-pipe of an ordinary kitchen-range, said Fig. 4 representing the parts in their relative positions when the damper in the pipe is closed, and in Fig. 5 the several parts being represented in their operated positions. Fig. 6 is a horizontal cross-section taken on line 6 6 in Fig. 5. Fig. 7 is a part face view and vertical section of a timepiece and its clock mechanism and a holding means to be connected with the door or damper operating means for releasing the same at the proper time. Fig. 8 is a cross-section of said clock mechanism, taken on line 8 8 in Fig. 7. Fig. 9 is a detail face view of a portion of the clock-frame and the releasing mechanism in its normally locked or holding position with a link or ring of the door or damper operating means, and Fig. 10 is a side view of the said releasing mechanism with the parts in their released positions to permit the actuation of the door or damper operating means. Figs. 11 and 12 are a front and side view, respectively, of a heater provided with a damper in the fire-box door of the same and a means for operating said damper, all made according to the principles of this invention. Fig. 13 is a side view of a furnace provided with a door or damper operating means of a slightly-modified form of construction and arrangement of the various parts, but still embodying the leading features of my invention; and Figs. 14, 15, and 16 are detail views of certain parts of the mechanism employed in the construction represented in said Fig. 13.

Similar letters of reference are employed in all of the said above-described views to indicate corresponding parts.

In said drawings, A indicates any suitable construction of heater provided with the usual door *a* to the fire-chamber and the ash-pit door *a'*, which is also provided with the usual form of hinged or pivoted lid or damper *a*².

Secured in a desirable position to the outer surface of the shell *a*³ of the heater, as indicated in Figs. 2 and 3, by means of keys *b* and wedges *b'* or in any other well-known manner, is a plate *c*, having an arm or post *c'*, provided with a pair of perforated lugs or ears *c*², in which is a thumb-screw *c*³ for adjustably securing between the lugs or ears *c*² a rod *c*⁴, which is provided at its free end with a supporting-hook *c*⁵. Upon this hook *c*⁵ can be detachably arranged the ring *d'* of a suitable timepiece *d*, which is provided with a pivoted arm or lever *e*, arranged within the clock-casing and operating in the manner to be hereinafter more fully set forth. The lower end *e'* of said arm or lever *e* extends from the clock-casing and has a hook-shaped portion *e*² for the reception and under normal conditions for the support thereon of a link or ring *f*, to which is attached a chain or other suitable flexible connection *f'*, on the lower end of which is a weight *f*². Connected with the said chain *f'* at *f*³ is a second chain or flexible connection *f*⁴, which passes through a ring *g'* on a bracket *g*, secured to the side of the shell of the furnace A, or any other similar means through which said chain or flexible connection *f*⁴ can be passed, said chain or flexible connection *f*⁴ being provided with a hook *f*⁵ or other suitable attaching device for detachably connecting said chain or connection *f*⁴ with a perforated lug or ring *a*⁵ of the door *a*, as will be clearly evident from an inspection of Fig. 1. Thus it will be evident that when the clock mechanism is released at the hour to which it has been set the lever or arm *e* is actuated by the downward tension of the weight *f*² and the chain or flexible connection *f'* connected therewith, thereby causing a pull upon the chain or connection *f*⁴, and automatically closing the furnace-door *a*, whereby the supply of fresh air, which serves as a check to the burning of the fire, is shut off, and the result will be that the fire burns up brightly previous to the throwing in of a fresh supply of coal. Should it be desired to open up the damper *a*² in the ash-pit door *a'* at the same time that the door *a* is closed, a chain or flexible connection *f*⁶ is connected at the one end with the said chain or flexible connection *f*⁴ and at the other end with the damper *a*², substantially as indicated in dotted outline in said Fig. 1. When the door or damper operating means has thus been actuated to close the door *a* or to open the damper *a*² or to operate both at the same time, the clock *d* can be removed from the hook *c*⁵ and may be used for other purposes.

The device may be employed in connection with the ordinary or any other suitable damper in the smoke-pipe *a*⁴ of the heater or that of a kitchen-range, as indicated in Figs. 4, 5, and 6. In this construction I have clamped upon the handle portion *a*⁶ of the damper *a*⁷, in any desirable manner, a rod *h*, extending horizontally in opposite directions from the handle portion *a*⁶ and provided at its ends with slotted portions *h'* and *h*², the portion *h*² acting simply as a counterbalance to the end portion *h'* and may, therefore, be of any other suitable shape. In the present construction the rod *c*⁴, which is provided with the aforementioned hook *c*⁵, on which the timepiece *d* is to be hung, may be secured directly to a band or strap, as *c*⁶, which can be attached in the proper position upon the pipe *a*⁴, substantially in the manner illustrated. Detachably connected with the hook-shaped end of the pivoted rod or arm *e* of the timepiece *d* is a ring-shaped end or eye portion *h*⁴ of a bar or rod *h*³, the lower end *h*⁵ of which is suitably enlarged or weighted, substantially as shown. At or near the central portion of said bar or rod *h*³ the latter has an outwardly-extending pin or stud, provided with a cross-piece *h*⁷, which can be made to enter the slotted end portion *h'* of the rod *h* to operatively and pivotally connect the parts *h* and *h*³, and whereby said parts readily assume the positions indicated in said Figs. 4 and 5. The operation of this mechanism is similar to that described in connection with Fig. 1, the arm or lever *e* being released from its holding engagement with the eye in the bar or rod *h*³, and the latter during its descent causing the bar or rod *h* to assume a vertical position, and thereby rotating the damper-journals in their bearings in the pipe *a*⁴ to cause the damper to assume its open position.

In some cases the clock device *d* may be employed to normally hold open a lid or damper *a*⁸ in the door *a* of the heater, as indicated in Figs. 11 and 12, and close the same when the arm or lever *e*, connected with the timepiece, is actuated. In this construction a connection *i* is attached, by means of a hook *i'* or in any other suitable manner, to a perforated lug or ear *a*⁹ on the said lid or damper *a*⁸, which is held open, when a ring *i*² or other holding means on the upper end of the connection *i* is placed over the hook end *e*² of the arm or lever *e*, as illustrated. A guide arm or rod *a*¹⁰ may extend from the surface of the shell *a*³ of the heater, being provided with a ring portion *a*¹¹, through which the connection *i* is passed to retain the same in its disconnected position from the hook end of the rod or arm *e*, when disengaged from the latter, by the ring *i*², resting above the ring portion *a*¹¹ of said rod *a*¹⁰ and still permitting the opening and closing of the door *a* when required.

In Fig. 13 I have illustrated an arrangement of door or damper operating means in

which the clock device d acts as a weight to actuate the several parts of the mechanism. In this construction I have suitably secured upon the surface of the shell a^3 of the heater a forwardly-extending post k , to the free end k' of which is secured the end k^3 of a rod k^2 , having at its free end a link portion k^4 , adapted to be arranged over the hook-shaped portion e^2 of the arm or lever e . In this case the flexible connection f^4 , hereinabove mentioned, which is attached at one end to the door a , passes through the ring g' of the bracket g and is attached at its lower end in a perforation e^3 in the hook-shaped end of the arm or lever e , substantially as illustrated. Thus when the arm or lever e is actuated the hook portion e^2 will become withdrawn from the link portion k^4 , as will be evident more especially from an inspection of Figs. 15 and 16, and the clock d will act as a sufficient weight to close the door a , as will be understood, the flexible connection f^4 retaining the clock in its lowered position.

The construction and arrangement of the parts of the timepiece for releasing the arm or lever e from its holding engagement with the door or damper operating mechanism are as follows: In Figs. 7 to 10, inclusive, d^2 indicates the usual framework of a suitable clock or gear mechanism which is actuated by the spring d^3 to be wound by means of the finger-piece d^5 . As will be seen from Figs. 7 and 8, d^6 is a toothed wheel which is in engagement with a pinion d^7 , driven from another toothed wheel d^8 on the main spindle d^4 . This said toothed wheel d^6 is rotatively but slidably arranged on a stem or spindle d^9 , provided at its one end with a finger-piece or knob d^{10} and near its other end, within the clock-casing, with a collar d^{11} , having a finger or stud d^{12} projecting therefrom, as clearly illustrated. The arrangement of the said stem d^9 , its knob d^{10} , and collar d^{11} is such that it can be readily turned by means of its finger-piece and an index hand or pointer d^{13} , set to the hour desired, at which the arm or lever e shall be released from its load to actuate the door or damper operating mechanism. The said arm or lever e is normally held in its load-retaining position by the load or weight supported from its hook portion e^2 , whereby the upper end e^4 of said arm or lever is forced against and retained in position by a shoulder or projection l' of a spring-plate l , which is secured at its upper end l^2 to the frame d^2 of the clockwork. The said spring-plate l has an opening l^3 , through which the stem or spindle d^9 passes and bears against the back of the toothed wheel d^6 , and thereby causes the cam-surface d^{14} to be forced against the back of the stud or finger d^{12} . At the determined hour the rotation of the wheel d^6 will have brought an offset d^{15} in the cam-surface d^{14} directly opposite the back of the said stud or finger d^{12} , and the spring-plate l causes the wheel d^6 to slide still farther forward, the parts assuming the positions indi-

cated in Fig. 10, and withdrawing the shoulder or projection l' from the upper end e^4 of the lever or arm e . The load or weight supported upon the hook end e^2 will immediately tilt the lever or arm e upon its pivotal support and become disconnected from the hook portion, the several parts of the door-closing or damper-operating mechanism being free to operate in a manner as will be clearly evident from an inspection of the several figures of the drawings. During this time a spring e^5 , which is connected with the arm or lever e and the frame d^2 , will return the said arm or lever to its former position, bringing the upper portion of said lever or arm against a stud or projection d^{16} until the spring-plate l and the wheel d^6 have again been returned to their former positions by the turning of the stem or spindle d^9 by hand or by the rotative action of the gear d^6 , thereby again causing the operative holding contact between the arm or lever e and the shoulder or projection l' of the spring-plate l , and the hook end e^2 being in position to be operatively connected with the door or damper operating mechanism.

The operations of the several devices will be clearly understood from the above description of the invention and from the accompanying drawings, and the mechanism may be employed with heaters, furnaces, ranges, and stoves of the various kinds.

I am fully aware that changes may be made in the several arrangements and combinations of the parts as herein described and illustrated without departing from the scope of my present invention. Hence I do not limit my invention to the exact arrangements and combinations of the parts as herein described and illustrated, nor do I confine myself to the exact details of the construction of such parts.

Having thus described my invention, what I claim is—

1. The combination, with the casing or frame of a furnace, heater, range, and the like, of a supporting device secured directly to said casing or frame, a clock mechanism removably suspended from said supporting device, comprising the frame thereof and a downwardly-extending arm projecting from an opening in the clock-casing, a holding device pivotally attached to said arm, and a load-releasing means detachably connected with said holding device for operating a door or damper, substantially as and for the purposes set forth.

2. The combination, with the casing or frame of a furnace, heater, range, and the like, of a supporting device secured directly to said casing or frame, a clock mechanism removably suspended from said supporting device, said clock mechanism comprising the frame thereof and a downwardly-extending arm projecting from an opening in the clock-casing, a lever pivoted on said downwardly-projecting arm, normally in holding engagement with said clock mechanism, but adapted

to be released therefrom, a spring connected with the upper portion of said lever and the frame of the clock mechanism, within the clock-casing, a hook-shaped holding portion 5 on the lower end of said lever extending from an opening in said clock-casing, and a load-releasing means detachably connected with said hook-shaped portion of said lever, substantially as and for the purposes set forth.

10 3. The combination, with the casing or frame of a furnace, heater, range, and the like, of a supporting device, secured directly to said casing or frame, a clock mechanism removably suspended from said supporting 5 device, said clock mechanism comprising the frame thereof and a downwardly-extending arm projecting from an opening in the clock-casing, a lever pivoted on said downwardly-projecting arm, normally in holding engagement 20 with said clock mechanism, but adapted to be released therefrom, a spring connected with the upper portion of said lever and the

frame of the clock mechanism, within the clock-casing, a hook-shaped holding portion 25 on the lower end of said lever extending from an opening in said clock-casing, and a load-releasing means detachably connected with said hook-shaped portion of said lever, consisting, essentially, of a flexible connection attached at one end to said hook-shaped portion of said 30 lever, a weight at the other end of said flexible connection, and a second flexible connection attached to said first-mentioned flexible connection and attached to a door or damper 35 for operating the same, substantially as and for the purposes set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 27th day of December, 1899.

SAMUEL S. COLT.

Witnesses:

FREDK. C. FRAENTZEL,
GEO. D. RICHARDS.