

No. 764,875.

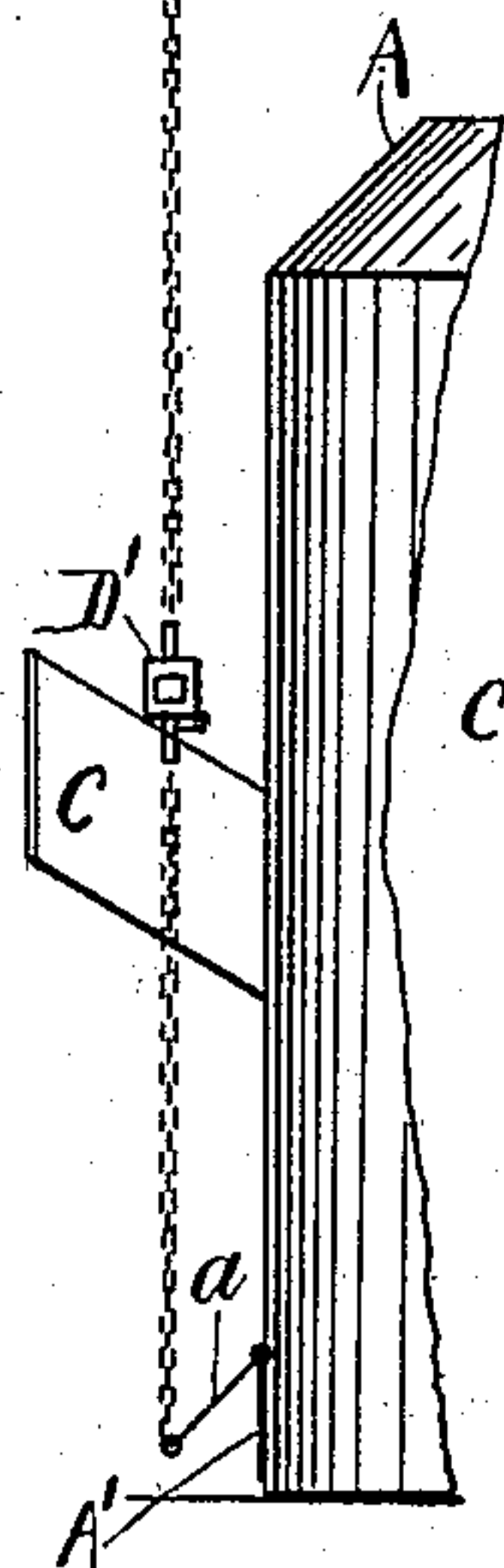
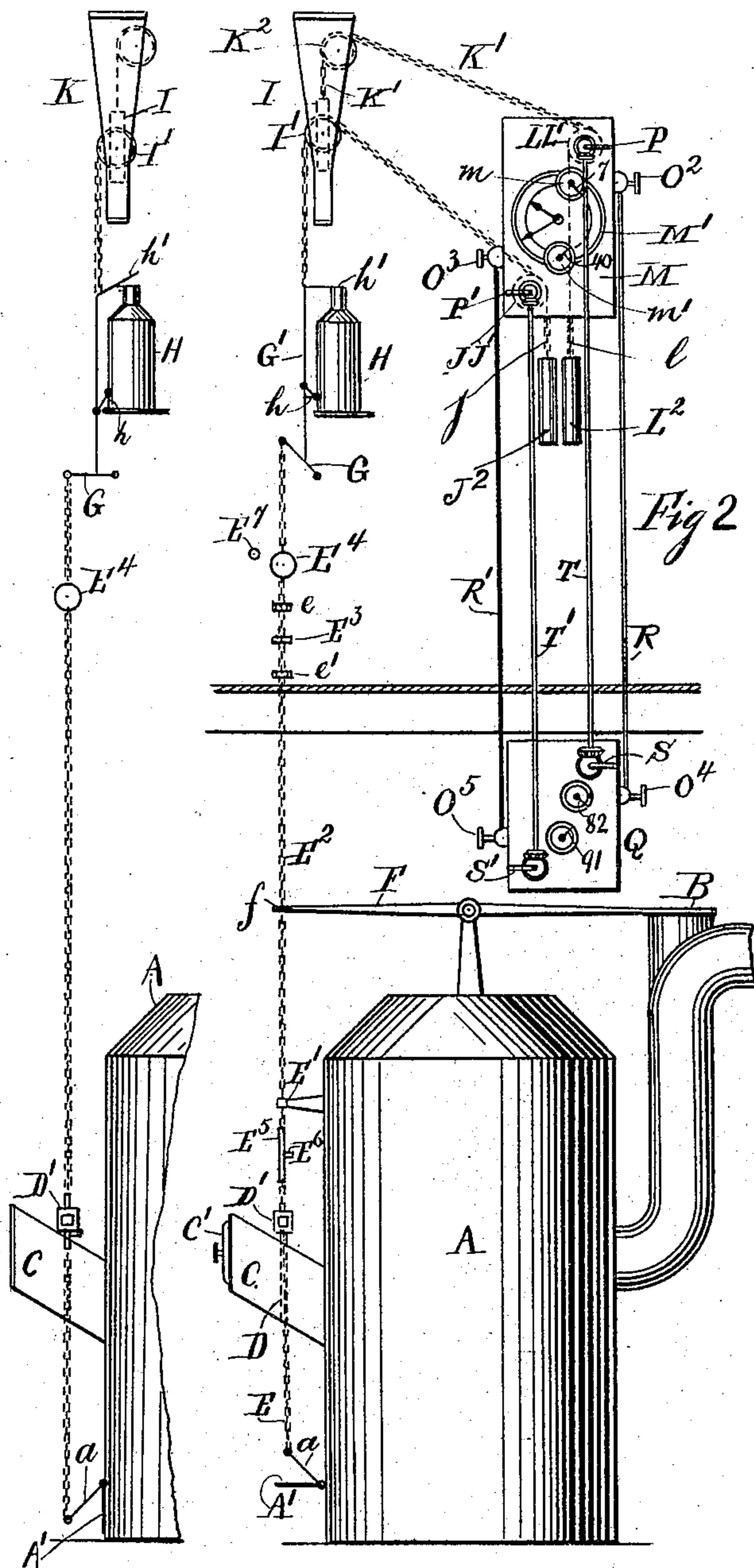
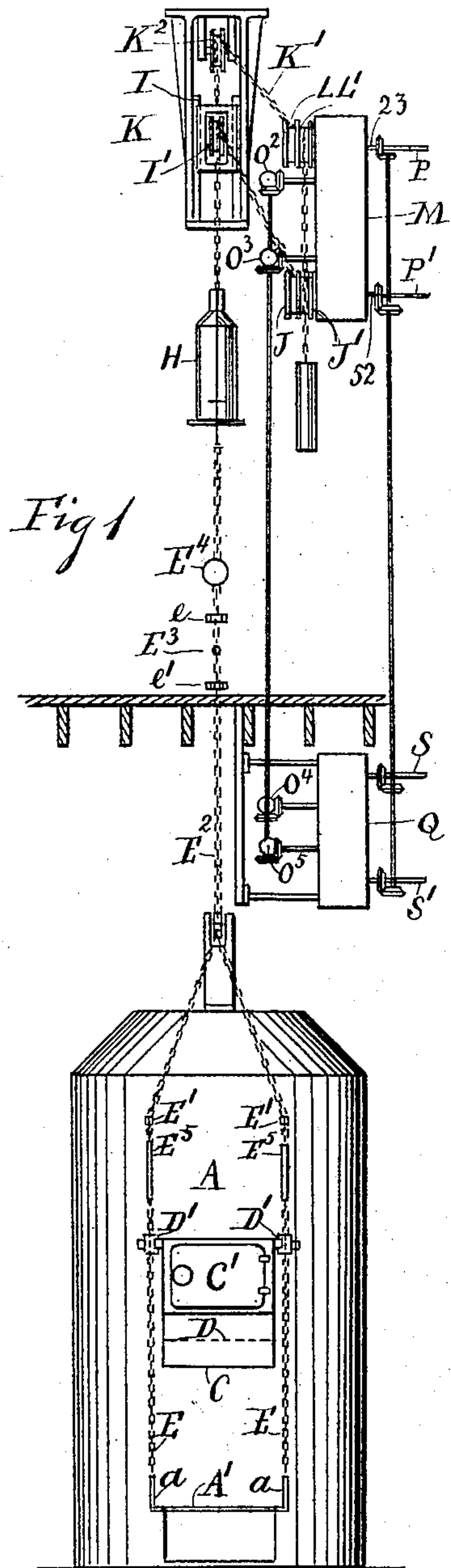
PATENTED JULY 12, 1904.

G. R. YOUNG.  
TIME DAMPER MECHANISM.

APPLICATION FILED JAN. 12, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

Ed Edson  
John L Russell

INVENTOR

George R. Young

BY

BY  
H. H. Borneville

ATTORNEY

No. 764,875.

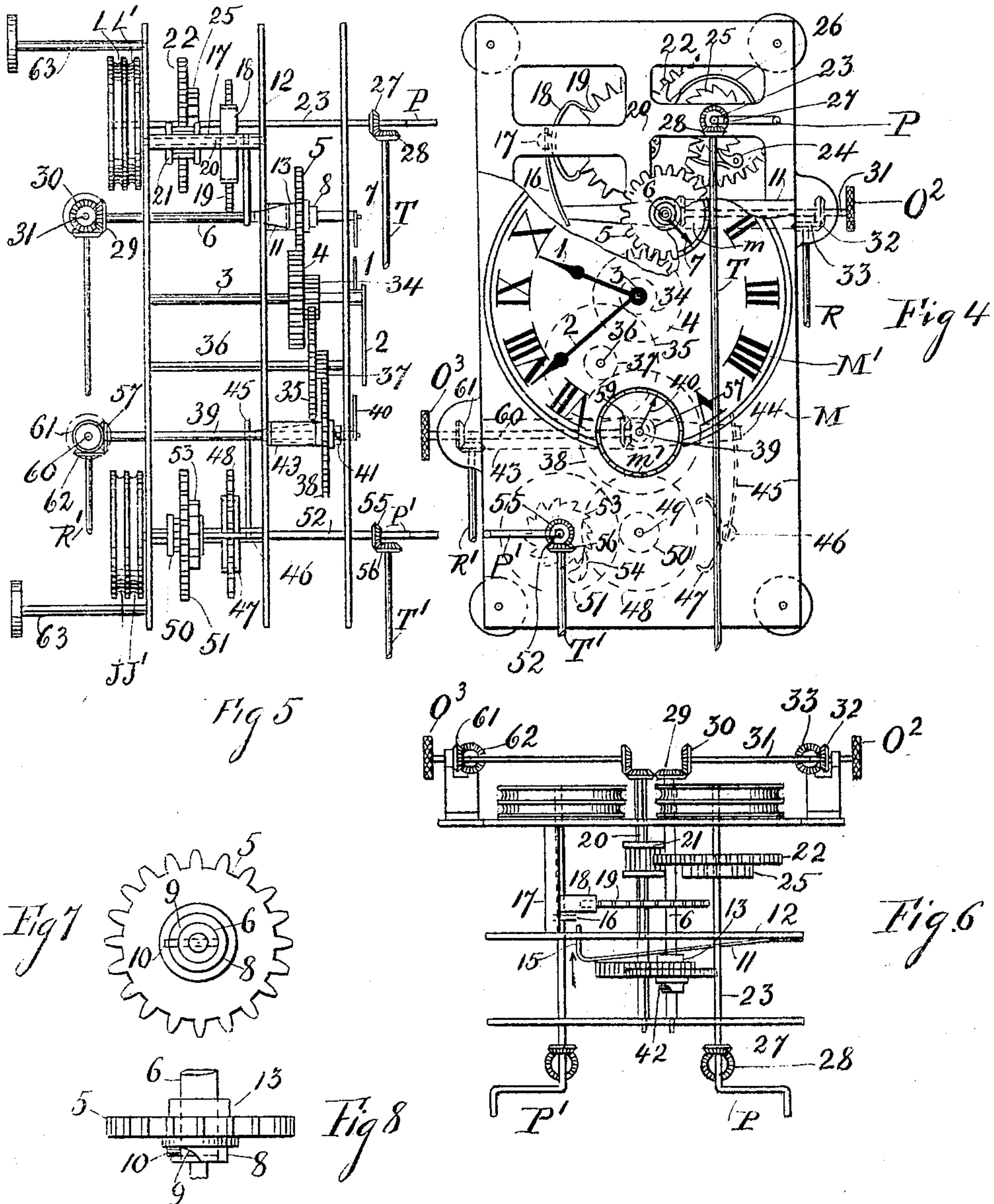
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3 SHEETS—SHEET 2.



WITNESSES:

*Edw. Edison*  
*John L. Russell*

INVENTOR

*George R. Young*

BY

*Edw. R. Young*

ATTORNEY



No. 764,875.

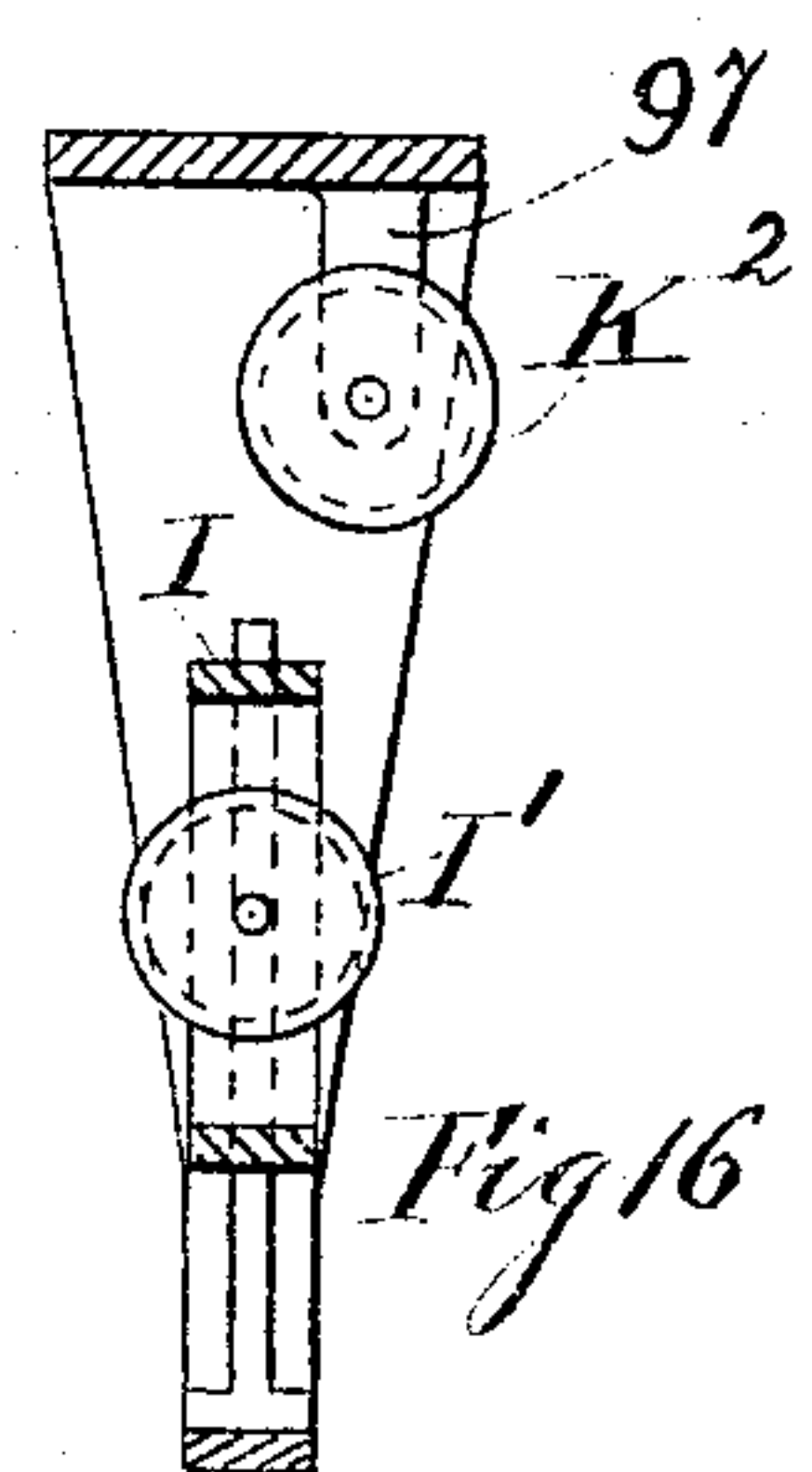
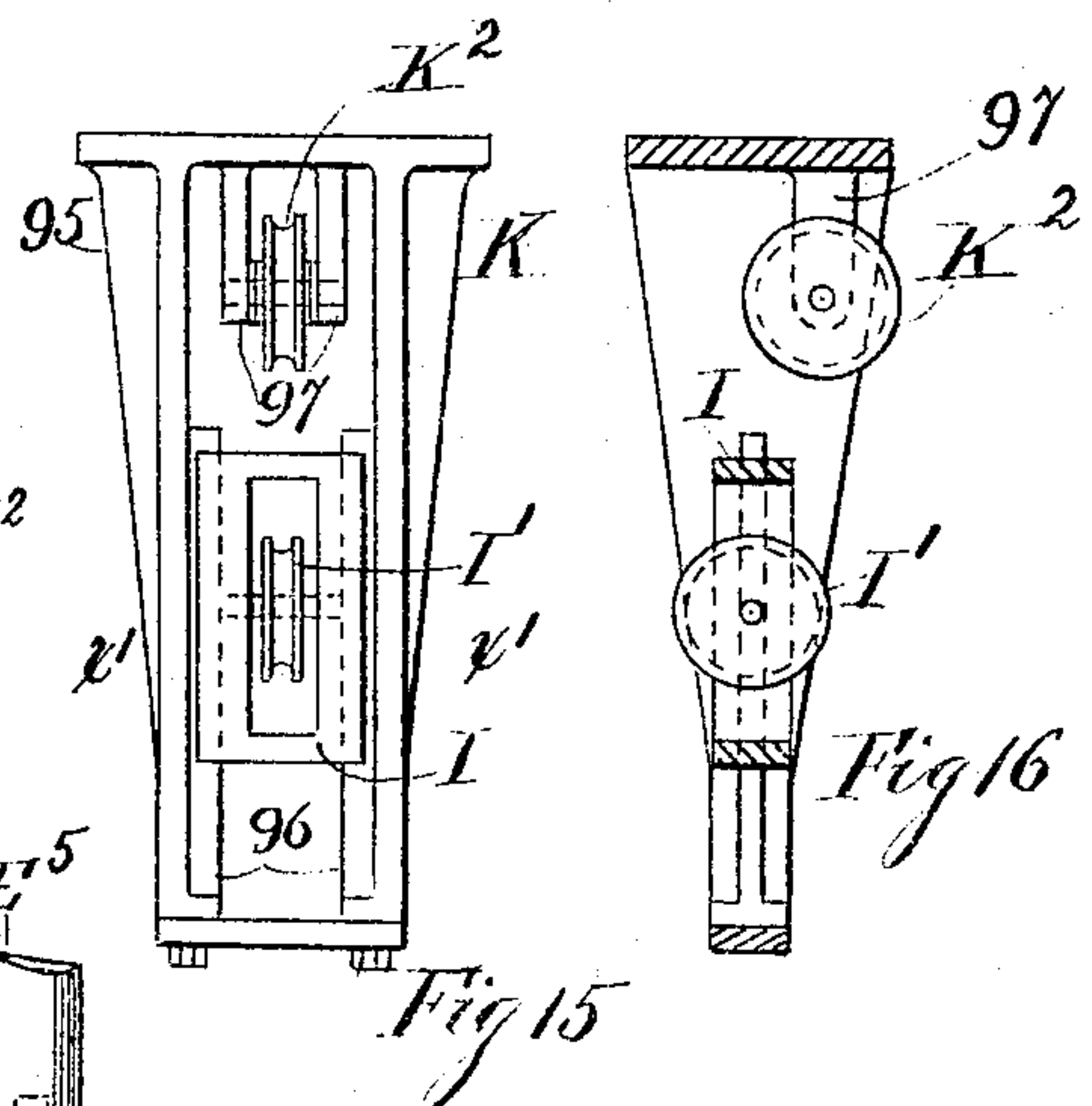
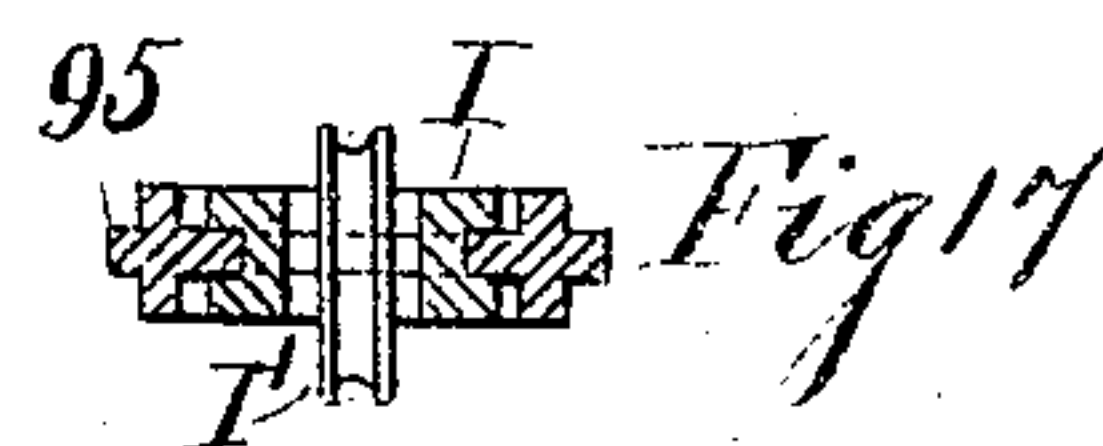
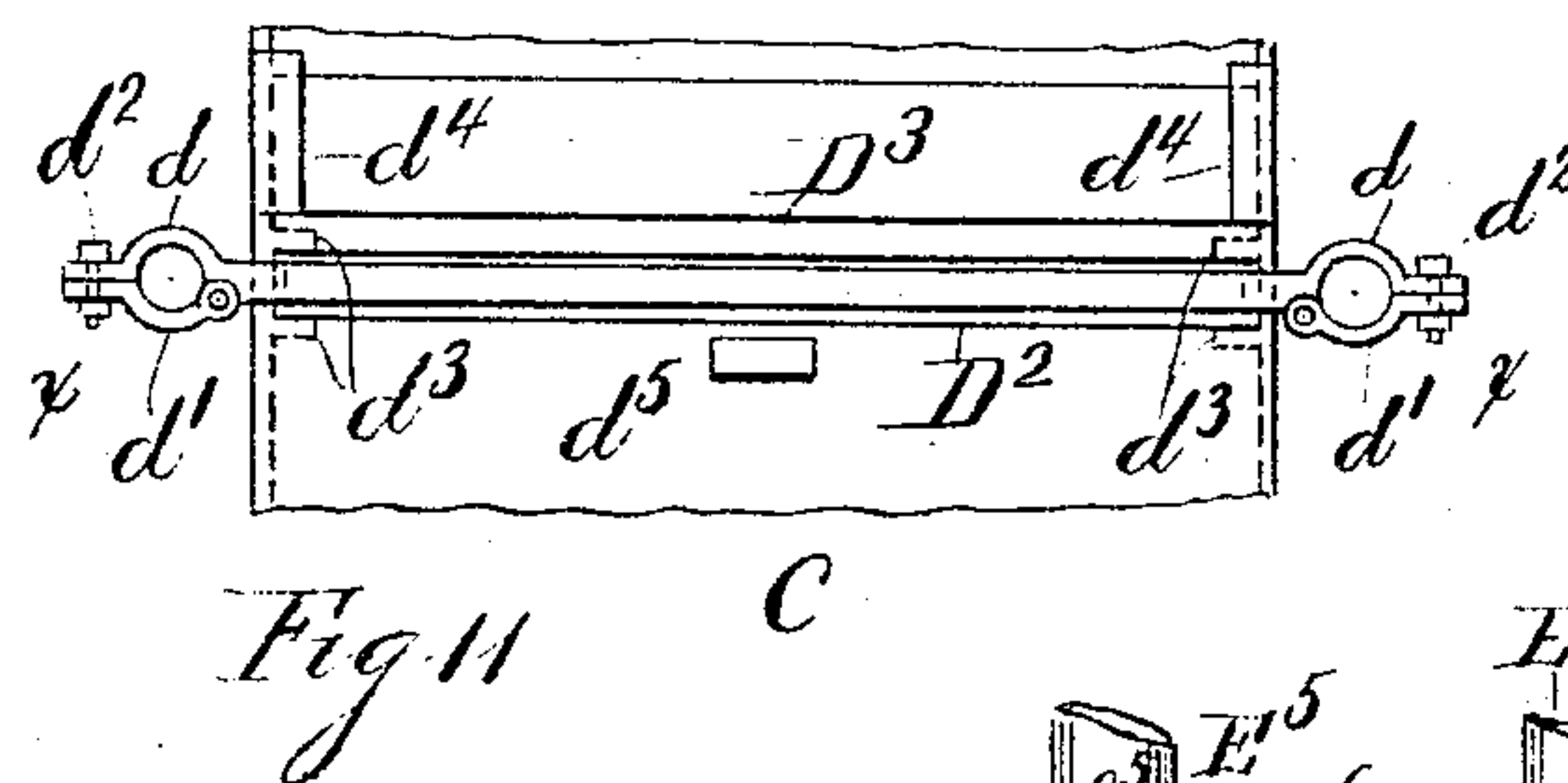
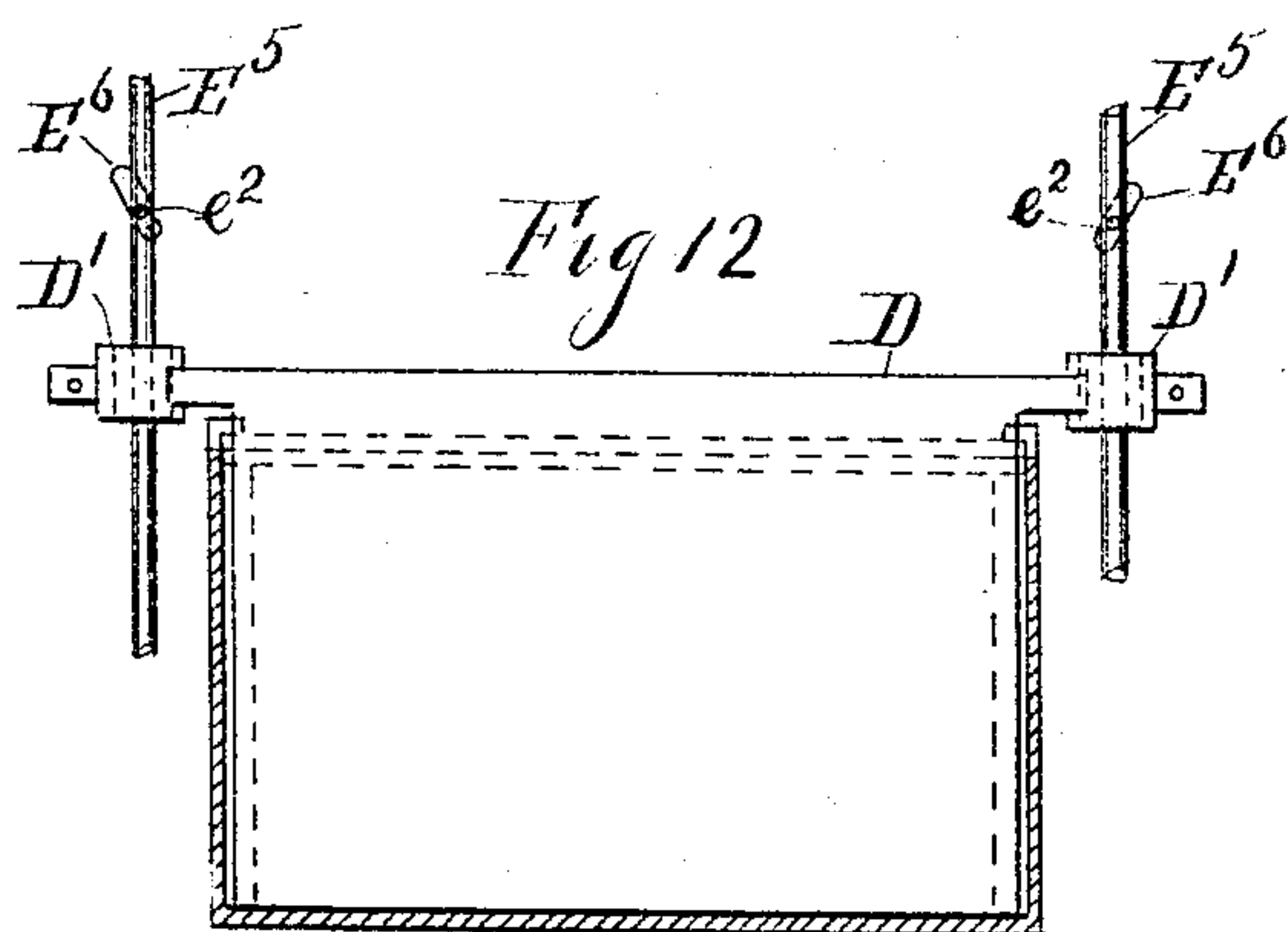
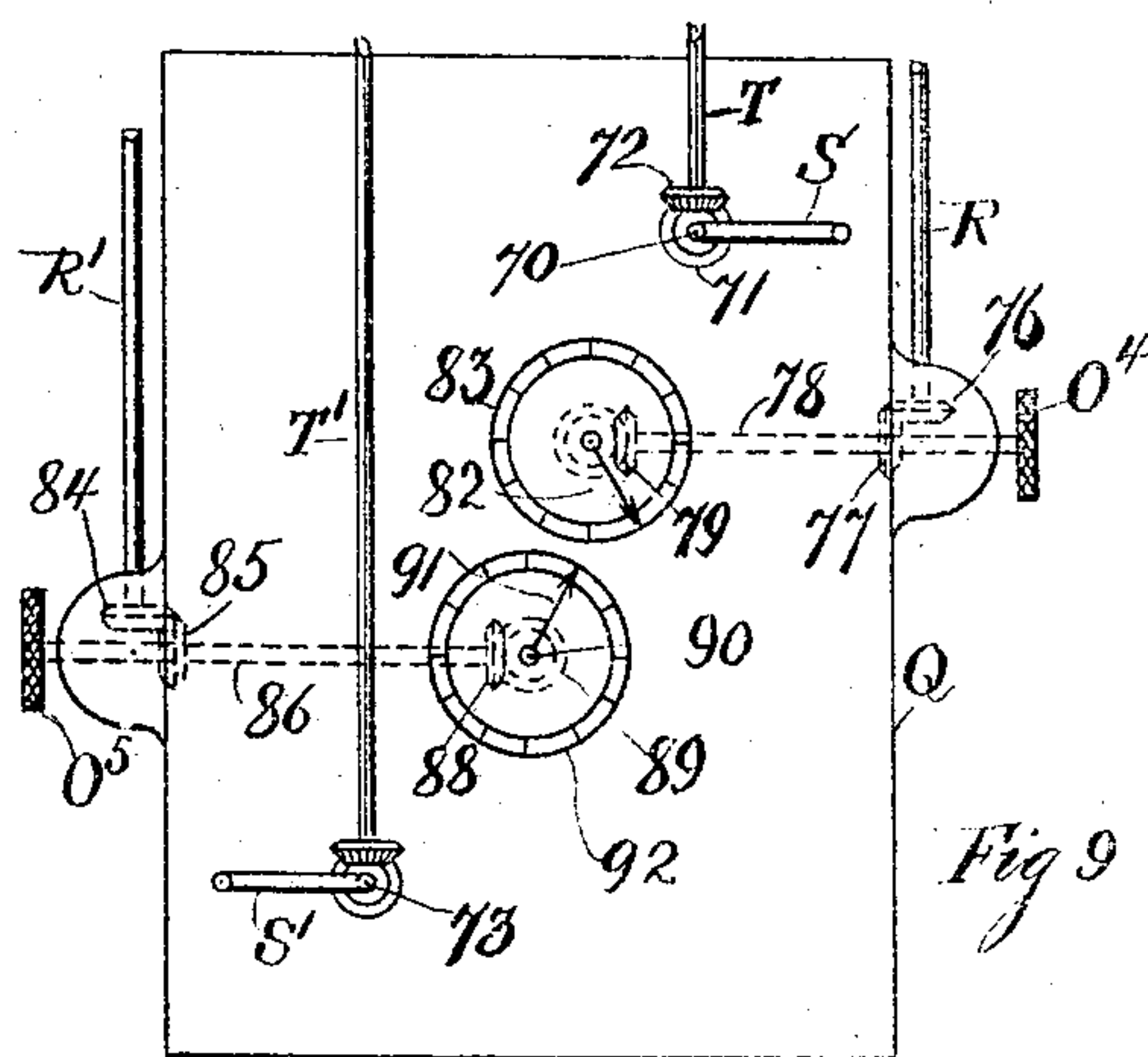
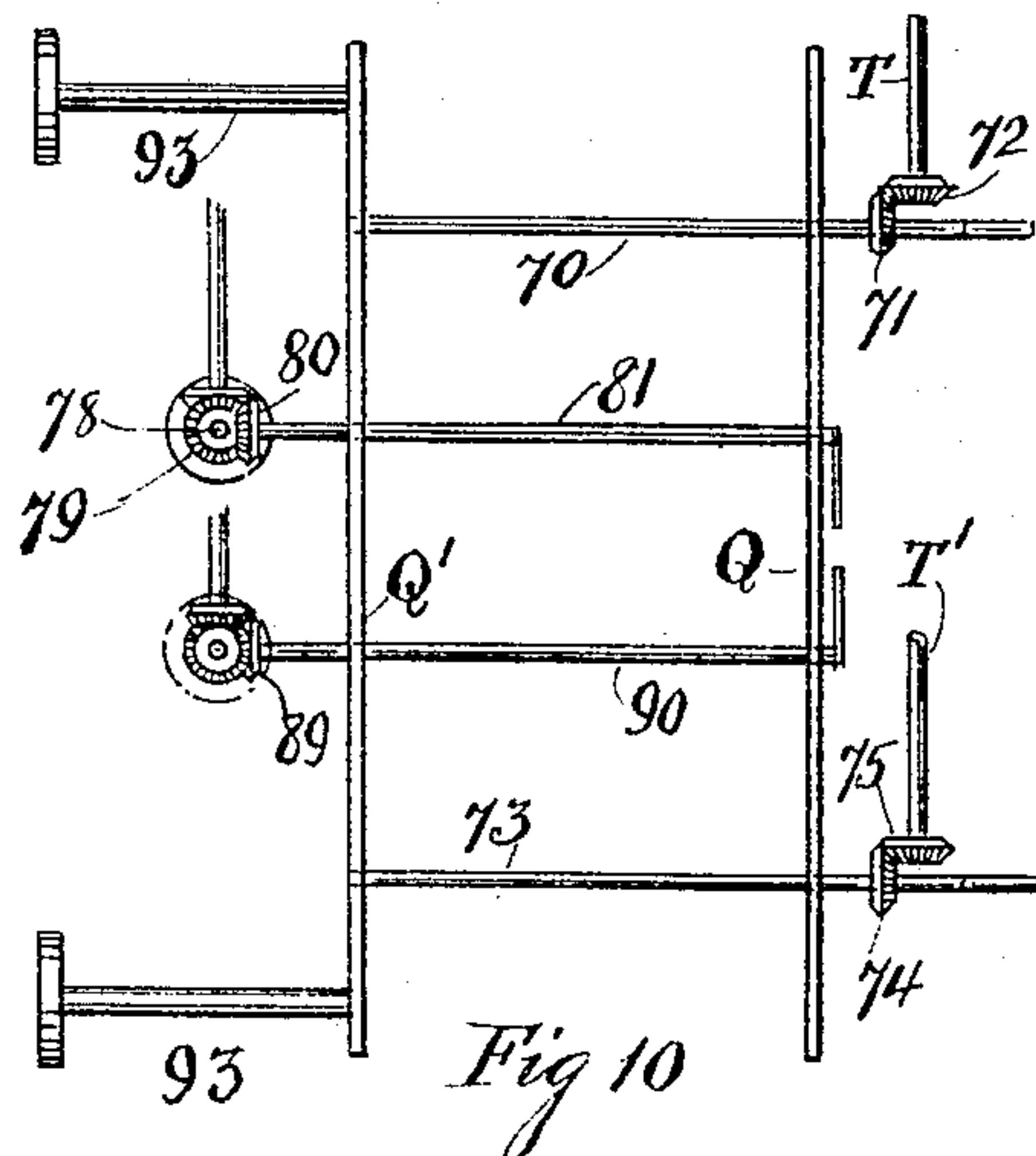
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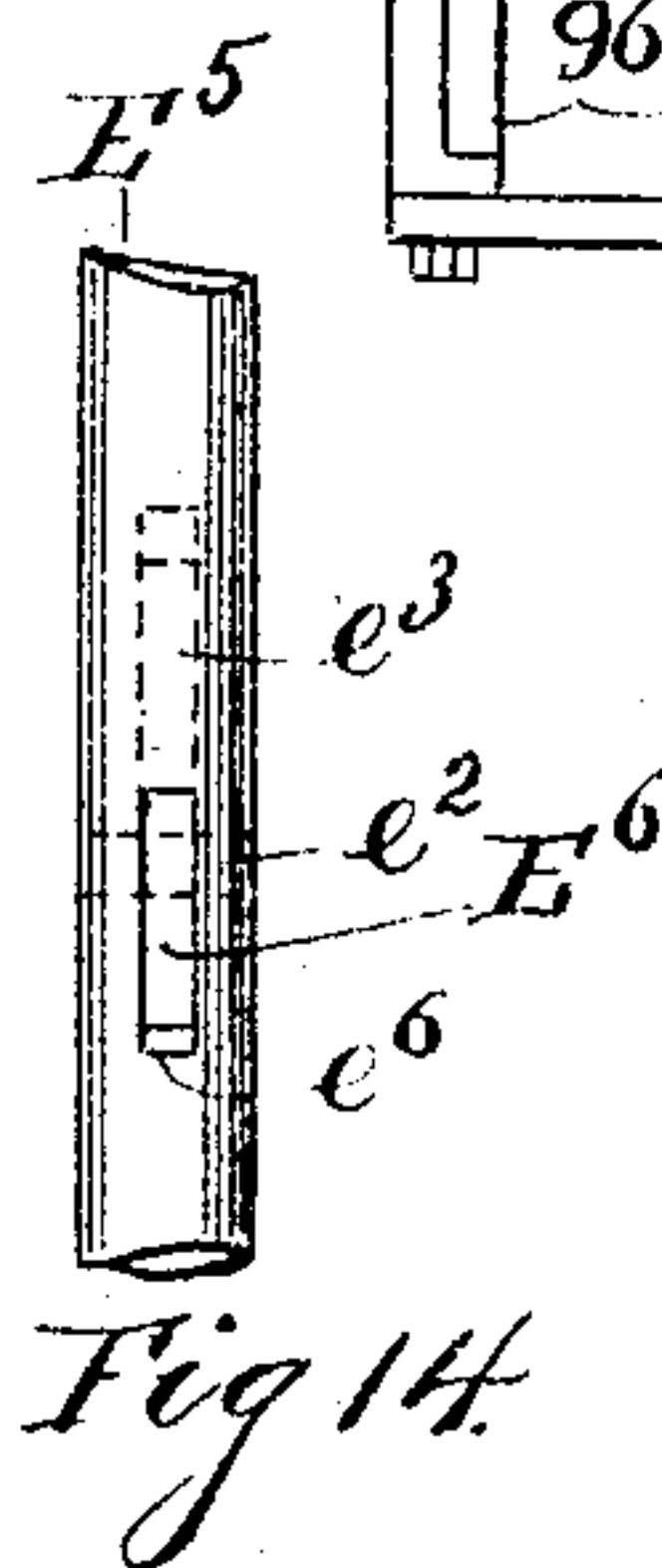
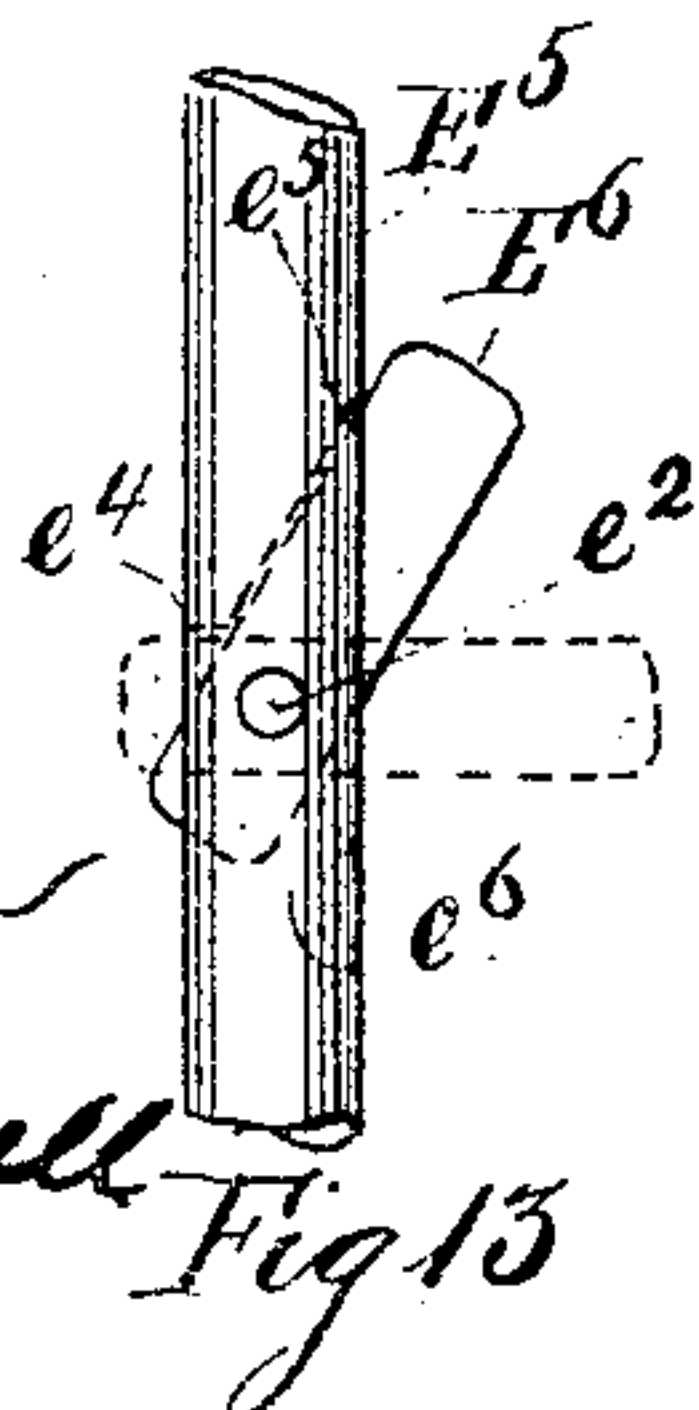
NO MODEL.

3 SHEETS—SHEET 3.



WITNESSES:

*Ed. Edson*  
*John L. Russell*



INVENTOR  
*George R. Young*  
BY  
*A. A. de Borneville*  
ATTORNEY



# UNITED STATES PATENT OFFICE.

GEORGE R. YOUNG, OF RIDGEWOOD, NEW JERSEY

## TIME DAMPER MECHANISM.

SPECIFICATION forming part of Letters Patent No. 764,875, dated July 12, 1904.

Application filed January 12, 1903. Serial No. 138,687. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE R. YOUNG, a citizen of the United States of America, and a resident of Ridgewood, in the county of Bergen, State of New Jersey, have invented certain new and useful Improvements in Reversible Damper-Regulating Apparatus, of which the following is a specification.

This invention relates to damper-regulating apparatus, and has for its object means with which the dampers and doors of a furnace, heater, boiler, and the like can be both opened and closed by time releasing apparatus or mechanism. Heretofore in this class of mechanisms the said dampers and doors have been placed in operative position by hand for either maintaining a draft or for checking the same and then the said mechanisms have been employed to either check the draft or open the same, securing the reversal of the positions of the valves and the like previously set by hand.

The organization of my invention is characterized by embodying the double function of both opening and checking or checking and opening the draft of furnaces and the like by operating in conjunction with a release mechanism such as is embodied in an ordinary clock or other timepiece and the like.

My invention also comprises an automatic stoking apparatus operated by the clock release mechanism.

Referring to the drawings, Figure 1 represents the front view of a heater with my invention attached. Fig. 2 shows a side view of Fig. 1. Fig. 3 is a partial side view of Fig. 1 with the movable parts in different operative positions. Fig. 4 is a front view of a clock with two alarm or releasing mechanisms and controlling devices. Figs. 5 and 6 represent, respectively, a side and top view of Fig. 4. Fig. 7 shows one of the spur-gears of the alarm or releasing mechanism with its appurtenances. Fig. 8 is a top view of Fig. 7. Fig. 9 shows a front view of a secondary dial-plate for the clock. Fig. 10 is a side view of Fig. 9. Fig. 11 shows a fragmentary top view of the stoker-chute for the furnace. Fig. 12 represents a partial section of Fig. 11 on the line  $x-x$ . Fig. 13 represents a front view of a pair of lifting-links for the stoker-

slide. Fig. 14 is a side view of Fig. 13. Fig. 15 shows a front view of a bracket with pulleys. Fig. 16 is an end view of Fig. 15. Fig. 17 represents a section of Fig. 15 on the line  $x'-x'$ .

Referring now particularly to Figs. 1, 2, 55 and 3, a furnace is represented at A, with an ash-pit door A', a cold-air valve or damper B, a chute C, leading to the coal-space of the heater, and a stoker valve or slide D in the chute. Chains E lead from arms  $a$ , extending from the door A', and pass through eyelets D' of the stoker-valve and through guides E', projecting from the furnace, after which they are secured to the end  $f$  of the lever F, which latter carries the cold-air valve B. A single chain E<sup>2</sup> runs up from the end  $f$  of the lever F and passes through two guides  $e e'$ , a stop E<sup>3</sup> being carried on the chain between the said guides. A ring E<sup>4</sup> is next carried on the chain E<sup>2</sup>, which is then fastened to an arm G, on which latter is pinned a lever G', controlling an ash-pit door  $h$  and a cold-air valve  $h'$  of a miniature furnace H, constituting an indicator. The chain then passes over a pulley I', journaled in a cross-head I, and next winds around the portion J of a double drum J J'. The cross-head I is suspended by a chain K', which passes over a pulley K<sup>2</sup>, and then winds around the portion L of the double drum L L'. The said double drums are each connected up with an alarm releasing mechanism. A clock M carries the releasing mechanisms, and, in addition to the dial M' to indicate the time, contains two dials  $m m'$ , with pointers 7 and 40, respectively, to indicate the predetermined time for operating the releasing mechanisms, the latter being set by the hand-wheels O<sup>2</sup> O<sup>3</sup>. The double drums L L' and J J' are carried on shafts 23 52, that terminate in cranks P P', by means of which the chains  $l j'$ , carrying weights L<sup>2</sup> J<sup>2</sup>, are wound around the portions L' and J' of the said double drums. The movements of the hand-wheels O<sup>2</sup> O<sup>3</sup> are communicated to the pointers 82 91 on the dials 83 92, respectively, of a lower dial-plate Q through the rods R R' and trains of gearing. The movements of the cranks P P' are transmitted to the cranks S S' on the said lower dial-plate by means of the rods T T' and the gearing connected up therewith.



I will now describe the details of the invention, and, referring to Figs. 4 to 8, a clock is represented at M with such parts of the time mechanism to show its connections with ordinary alarm mechanisms, it being evident that any of the various alarm mechanisms in common being capable of use with my invention, and for the purpose of explanation the alarm mechanisms shown will be described herewith. The hour-hand 1 and minute-hand 2 of the clock are shown on the dial M', and the hour-post 3 is represented to carry a spur-gear 4, which constitutes the driver of the releasing mechanism. A spur-gear 5 meshes with the gear 4 and is carried loosely on the shaft 6, that carries the pointer 7. The spur-gear 5 carries a drum 8, having the cam 9. A pin 10 extends from the shaft 6, to be engaged by the said cam 9, so as to move the gear 5 inwardly on its axle 6 when the pin 10 rides on the said cam. A spring 11 is secured to the frame 12 of the clock and bears against the boss 13 of the spur-gear 5. The said spring 11 terminates at its free end in a hook 15, and when the spring is pressed inwardly in the direction shown by the arrow in Fig. 6 it engages an arm 16, extending from the spindle 17, that carries a verge 18, which latter engages an escapement-wheel 19. A spindle 20 carries the wheel 19, as well as a pinion 21, which latter meshes with a spur-gear 22, that is mounted loosely on the shaft 23. The spur-gear 22 has pivoted on its face a pawl 24, which engages a ratchet 25, secured to the shaft 23, and a spring 26 keeps the said pawl in engagement with the said ratchet 25. The shaft 23 has secured to it at its rear end the double drum L L', and at its front end it carries a bevel-gear 27, which meshes with a bevel-gear 28, and the said shaft is then formed into a crank P. The bevel-gear 28 is secured on the vertical rod T, as already described. The axle 6 at its rear end carries a bevel-wheel 29, which meshes with a bevel-wheel 30, carried on a spindle 31, the latter carrying also the bevel-gear 32 and hand-wheel O<sup>2</sup>, a bevel-gear 33 meshing with the wheel 32 and carrying the rod R. The shaft 6 extends through the frame 12 and carries the pointer 7 over the dial m to set the release mechanism. On the hour-post 3 there is mounted a pinion 34, which meshes with a gear 35, carried on an axle 36, on which latter there is mounted a pinion 37, that meshes with a gear 38, which is loosely mounted on the axle 39, the latter carrying the pointer 40 for the dial m'. The gear 38 carries a drum 41, on which there is a cam similar to the cam 9 on the drum of the wheel 5, and a pin 42, carried on the axle 39, is arranged to be engaged by said cam. A spring 43 extends from the frame 12 and bears against the spur-gear 38, the said spring being shaped like spring 11—that is, terminating in a hook 44, that engages an arm 45, extending from a spindle 46, which latter car-

ries the verge 47, engaging the escapement-wheel 48, and on the axle 49 of the latter there is mounted a pinion 50, that meshes with a spur-gear 51, loosely supported on the shaft 52, a ratchet-wheel 53 being secured to the shaft 52, which latter is engaged by a pawl 54, pivoted to the wheel 51. The shaft 52 at its rear end carries the double drum J J', and at its front end it carries the bevel-wheel 55, that meshes with the bevel-wheel 56, the latter being supported on the rod T', and it will be noted that the front of the shaft 52 terminates in the crank P'. The shaft 39 at its front end carries the pointer 40 and at its rear carries the bevel-wheel 57, which latter meshes with the bevel-wheel 61, that is carried on a shaft 60, and to the latter is fastened the hand-wheel O<sup>3</sup>, as well as bevel-wheel 61, that meshes with a bevel-wheel 62, that is secured to the rod R'. Legs 63 extend from the clock to fasten it to a suitable support.

It will be noted that the alarm releasing mechanism for the pointer 40 is similar to the alarm mechanism connected with the pointer 7 and that the train of gearing on the shafts 3 and 36, connecting the latter alarm mechanism with the spur-gear 4, secures an alarm releasing mechanism, which allows of closer adjustment for releasing than the mechanism connected with the pointer 7. Although it is generally desirable to interpose the said train of gearing, the lower alarm mechanism may be connected with the hour-post in the ordinary way.

Referring to Figs. 9 and 10, the lower dial-plate is shown at Q with a rear plate Q', to which there is journaled the shaft 70, terminating in the crank-handle S, carrying a bevel-wheel 71, that meshes with a bevel-wheel 72, supported on the rod T. A shaft 73, terminating in crank S', is journaled in the plates Q Q', and it supports a bevel-wheel 74, that meshes with a bevel-wheel 75, which latter is carried on the rod T'. The rod R carries the bevel-gear 76, that meshes with the bevel-gear 77, carried on the shaft 78, the latter also carrying the hand-wheel O<sup>4</sup> and bevel-gear 79, which meshes with the bevel-gear 80, fastened on the shaft 81, the latter carrying a pointer 82 for the dial 83. The rod R' carries the bevel-gear 84, that meshes with the bevel-gear 85, carried on the axle 86, on which latter there is the hand-wheel O<sup>5</sup> and bevel-wheel 88, that meshes with the bevel-wheel 89, supported on the shaft 90, the latter carrying the pointer 91 for the dial 92. Legs 93 extend from the plate Q' to secure the same to a suitable support.

Referring to Figs. 11 to 14, the slide D has extending from its sides the hinged eyelets D', comprising the stationary members d, to which are hinged the movable member d', bolts d<sup>2</sup> holding the latter in place. Through the eyelets D' there actuate links E<sup>5</sup>, which carry secondary links E<sup>6</sup> in suitable openings



$e^3$  by means of pivots  $e^2$ , the top faces of the openings being formed, as shown, by the dotted line  $e^4 e^5$ , and the bottom of the opening is represented by the line  $e^6$ . The slide D actuates through an opening  $D^2$  in the top of the chute C and is kept in position by the projecting lugs  $d^3$ . When the slide D is removed from the chute C, a cover  $D^3$ , held in guides  $d^4$ , is moved over the opening  $D^2$ , the cover 10 butting against a stop  $d^5$ .

Referring now to Figs. 15 to 17, a bracket is represented at K, comprising the frame 95, carrying the guides 96 for the cross-head I, in which is journaled the pulley I'. A secondary pulley  $K^2$  is journaled in lugs 97, extending from the frame.

To operate my invention, it may be assumed that the furnace A is to be supplied with coal or other fuel and it is desirable to maintain 20 the draft through the furnace for a predetermined length of time. The lower ash-pit door  $A'$  being open and the cold-air valve or damper  $B'$  closed, as shown in Figs. 1 and 2, the cross-head I' and weight  $L^2$  being in their 25 highest position by having wound the chains  $K'$  and  $L$  on the drum  $L L'$  by means of the crank P, as also the weight  $J^2$ , with its chain  $j$  wound around its drum  $J'$  by the crank  $P'$  and the chain E wrapped around the drum J 30 and of such a length to maintain door  $A'$  open, the valve B being sufficiently weighted to keep it closed, coal is now led to the furnace through the chute C, the slide D having been previously removed by taking out the bolts  $d^2$  35 and swinging the hinged portions  $d'$  of the eyelets  $D'$  out of the way. The furnace-door  $C'$  is now closed, the slide D inserted in place, so as to close off the chute from the furnace, and the said chute filled with coal in front of 40 the said slide D. Next the pointer 7 is set so as to release the upper releasing mechanism, which controls the position of the cross-head I, in a short interval of time, at the expiration of which the weight  $L^2$  will drop and unwind 45 the chain  $K'$ , which will lower the cross-head I, close the door  $A'$ , and open the air valve or damper B, thereby closing off the draft to the furnace, and at the same time the links  $E^6$  will slip through the eyelets  $D'$  without disturbing the slide D. The pointer 40 having 50 also been previously set so that the lower releasing mechanism will operate at a predetermined time, the door  $A'$  will remain closed and the valve B open until the latter releasing mechanism operates, at which instant the 55 weight  $J^2$  drops, and the valve B is thereby closed, the door A opened, and the slide D raised, opening the draft for the furnace and introducing the fuel held in the chute C into 60 the furnace A. Should the operator be near the furnace and not on the floor above, it is evident that all the foregoing operation can be handled by means of the crank-handles S S' and wheels  $O^4 O^5$ . Should the operator de- 65 sire to control the draft by hand, the ring E

is unhooked from the chain  $E^2$  and the furnace controlled by raising and lowering the chain  $E^2$  by means of the said ring  $E^4$ . The stroke of the chain  $E^2$  is at all times controlled by the stop  $E^3$  operating between the guides 70  $e$  and  $e'$ , and the ring can be placed on a pin  $E^6$  when it is desired to maintain the draft open a considerable time, and when to be checked the ring E is allowed to rest on the guide  $e$ .

It is evident that instead of the weights  $J^2$  75  $L^2$  a spring release mechanism might be substituted; also, that the lower dial-plate Q and model H might be dispensed with, it being noted that the said model indicates the exact positions of the doors and dampers of the fur- 80 nace.

It is evident that any of the various forms of time release mechanisms in common use might be employed; also, that for the valve B a butterfly-damper could be substituted. 85

Having described my invention, I claim—

1. In a heater the combination of a time-piece, two release mechanisms connected therewith, a movable support allowed to actuate by means of one of said release mechanisms, 90 a damper on the heater allowed to move in one direction by means of the movable support and the release mechanism connected therewith, and the said damper allowed to move in the opposite direction by the other 95 release mechanism.

2. In a heater the combination of a time-piece, two release mechanisms connected therewith, each of said mechanisms having a drum, a movable support, and a chain connecting the 100 latter and one of the drums, a damper on the heater, a chain leading from the damper over the support and to the other drum.

3. In a heater the combination of a time-piece, two release mechanisms connected therewith, each of said mechanisms having a drum, a movable support, a chain connecting the latter and one of the drums, a damper on the heater, a stoker connected with the heater, a chain connecting the damper and stoker lead- 110 ing over the support to the other drum.

4. In a heater the combination of a clock, two release mechanisms connected therewith, each of said mechanisms having a drum, a movable support, a chain connecting the latter and one of the drums, a damper, a stoker and an indicator connected up with the heater, a chain connecting the said damper, stoker and indicator, and leading over the support to the 120 other drum.

5. In a heater the combination of a clock, a release mechanism controlled by the clock, a double drum connected to the said release mechanism, a chain with a weight wrapped around the double drum, a movable support, 125 a pulley journaled adjacent to the said support, a chain leading from the support over the said pulley and connected to the double drum and alongside of the chain supporting the weight on said double drum, a second re- 130



- lease mechanism connected to the clock, a second double drum connected to the latter, a chain wrapped around the latter drum and carrying a weight, a damper on the heater, a chain connected to the damper running over the pulley in the said movable support and connected to the second double drum, and means to wind up the chains carrying the weights on their respective drums.
6. In a heater the combination of a clock, two releasing mechanisms connected therewith, a drum connected with each of said mechanisms, a weighted chain wrapped around each drum, a chain wrapped around one drum to unwind when its weighted chain unwinds, a chain wrapped around the other drum to wind around its drum when its weighted chain unwinds, a movable pulley actuated by the first drum, a damper on the furnace actuated by the other drum.
7. In a heater the combination of a clock, two release mechanisms connected therewith, a drum connected with each of said mechanisms, a weighted chain wrapped around each drum, a bracket, a movable cross-head fitted in the bracket, a pulley journaled in the cross-head, a second pulley journaled in the bracket, a chain leading from one of the drums over the second pulley and attached to the cross-head, a damper on the furnace, a chain leading from the second drum over the pulley in the cross-head and fastened to the damper.
8. In a heater the combination of a clock, a release mechanism controlled by the clock, a damper on the heater, a chute connected to the heater, a slide in the chute, a chain leading from the release mechanism to the damper, and arranged to actuate the damper when moving in one direction, and actuating both the said damper and slide when moving in the opposite direction.
9. In a heater the combination of a clock, a

releasing mechanism controlled by the clock, a dial with a pointer for the releasing mechanism, a damper on the furnace controlled by the releasing mechanism, a second dial with a pointer, connections between the two pointers.

10. In a heater the combination of a clock, a releasing mechanism controlled by the clock, means to wind up the releasing mechanism connected to the clock, and secondary means to wind up the releasing mechanism distant from the clock, and connections between both of said means.

11. In a heater the combination of a clock, a releasing mechanism connected to the clock, a damper on the heater actuated by the said releasing mechanism, a chain-weighted drum connected to the releasing mechanism, a crank on the shaft of the said drum to wind the chain thereon, a bevel-gear on the said shaft, a second shaft with a crank and a bevel-gear distant from the drum, a rod with a bevel-gear on each end, one of which gears meshes with the gear on the shaft of the releasing mechanism, and the other gear meshing with the bevel-gear on the shaft distant from the releasing mechanism.

12. In a heater the combination of a clock, two releasing mechanisms connected to the clock, a dial with a pointer for each releasing mechanism on the clock, a secondary dial with a pointer for each releasing mechanism, connections between each pair of pointers on the two dials, means to wind up each releasing mechanism on one dial connected with means on the other dial to wind up the releasing mechanism.

Signed at New York, county and State of New York, this 9th day of January, 1903.  
GEORGE R. YOUNG.

Witnesses:

JOHN L. RUSSEL,  
E. D. EDSON.