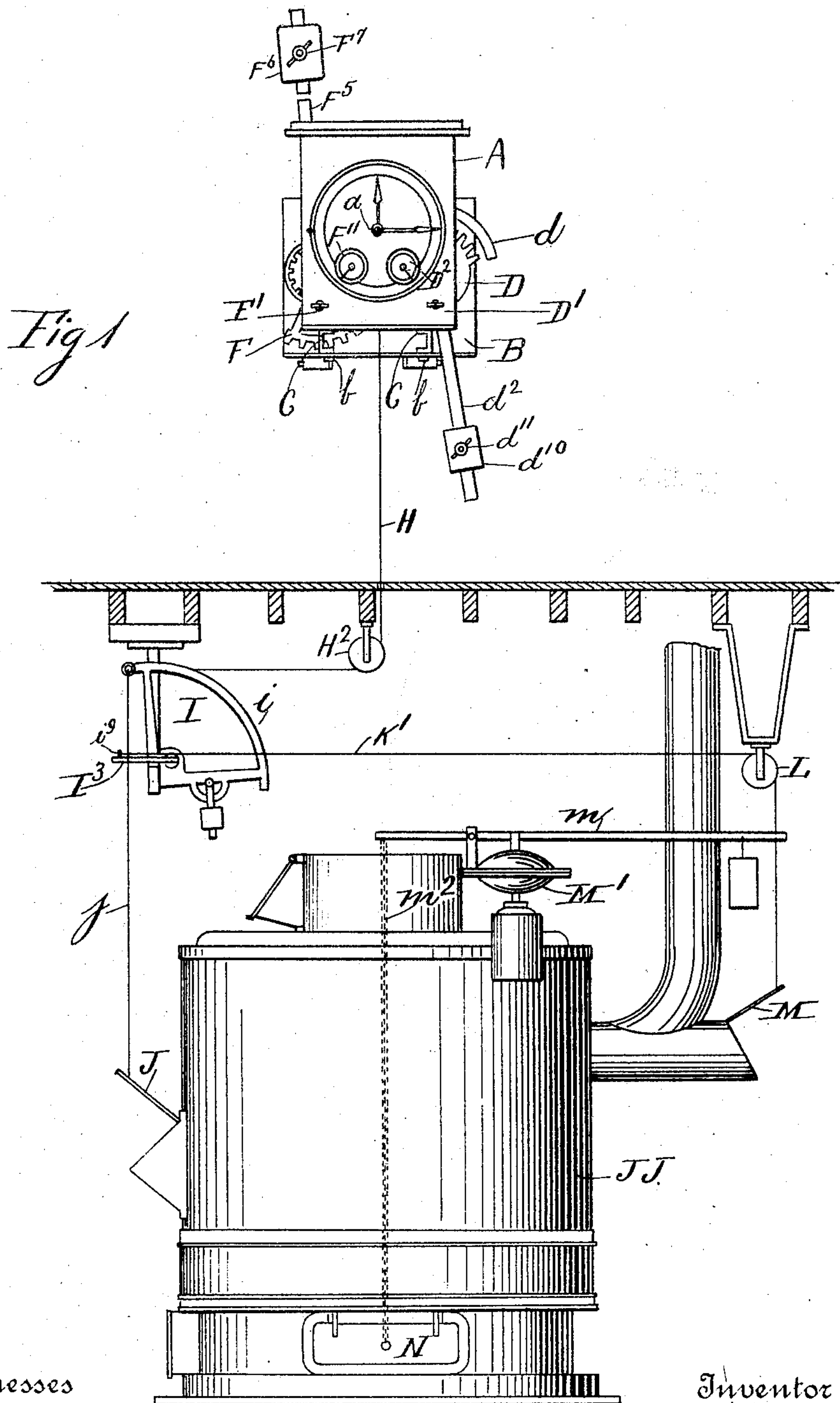


G. R. YOUNG.
TIME DAMPER APPARATUS.
APPLICATION FILED MAR. 14, 1904.

4 SHEETS—SHEET 1.

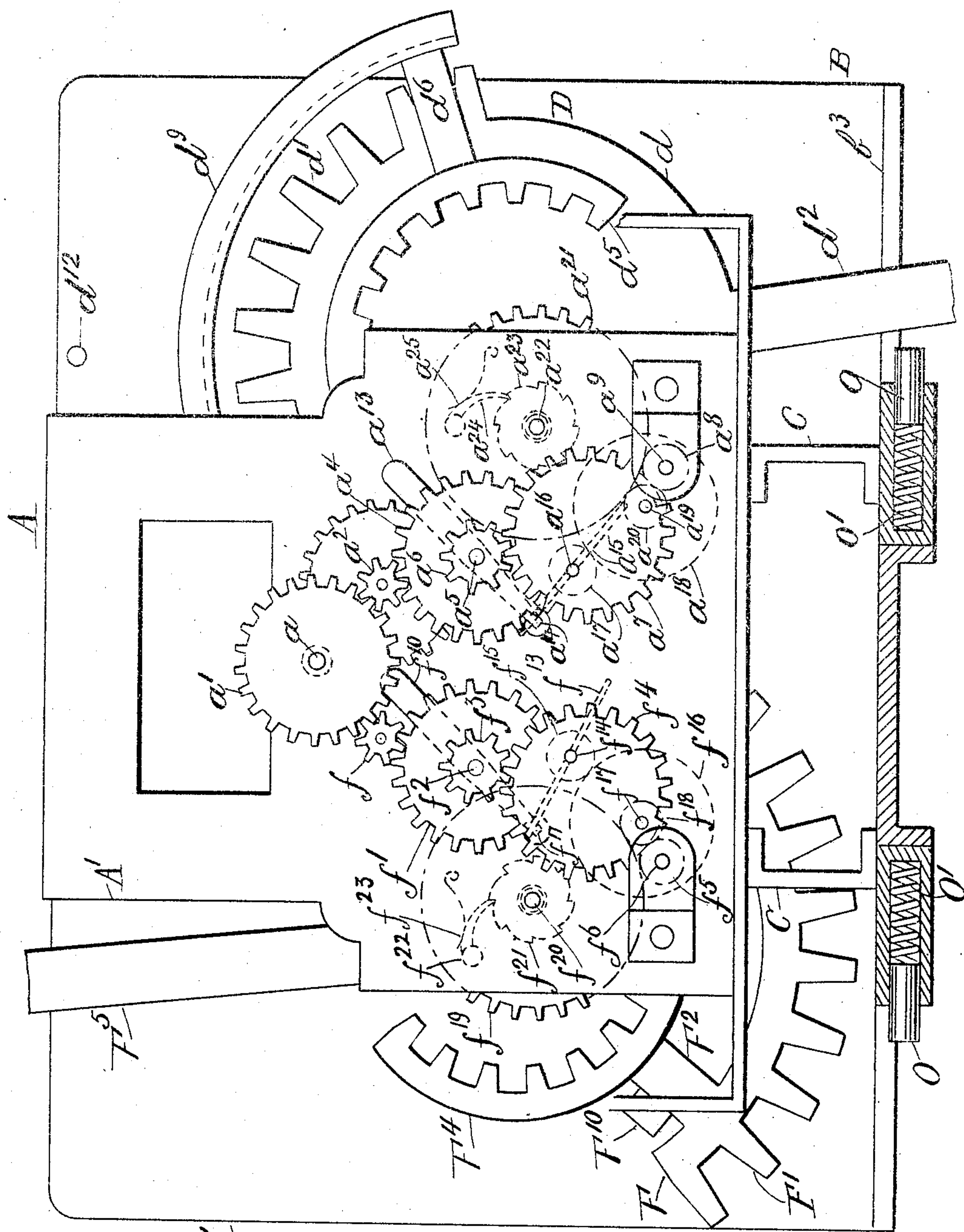


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G. R. YOUNG.
TIME DAMPER APPARATUS.
APPLICATION FILED MAR. 14, 1904.

4 SHEETS—SHEET 2.



WITNESSES:

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D. O. H.

Fig 2

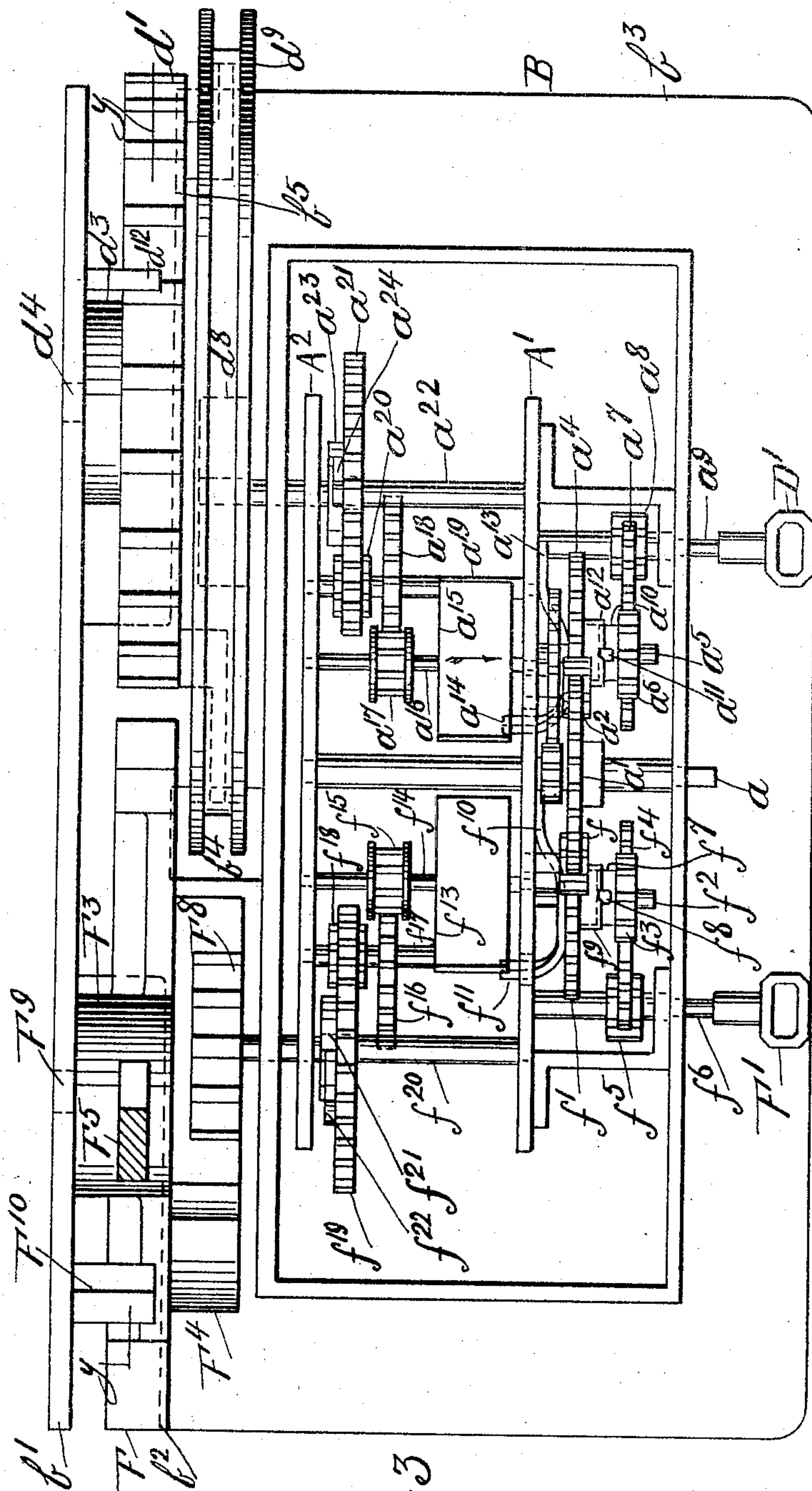
INVENTOR
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No. 781,170.

PATENTED JAN. 31, 1905.

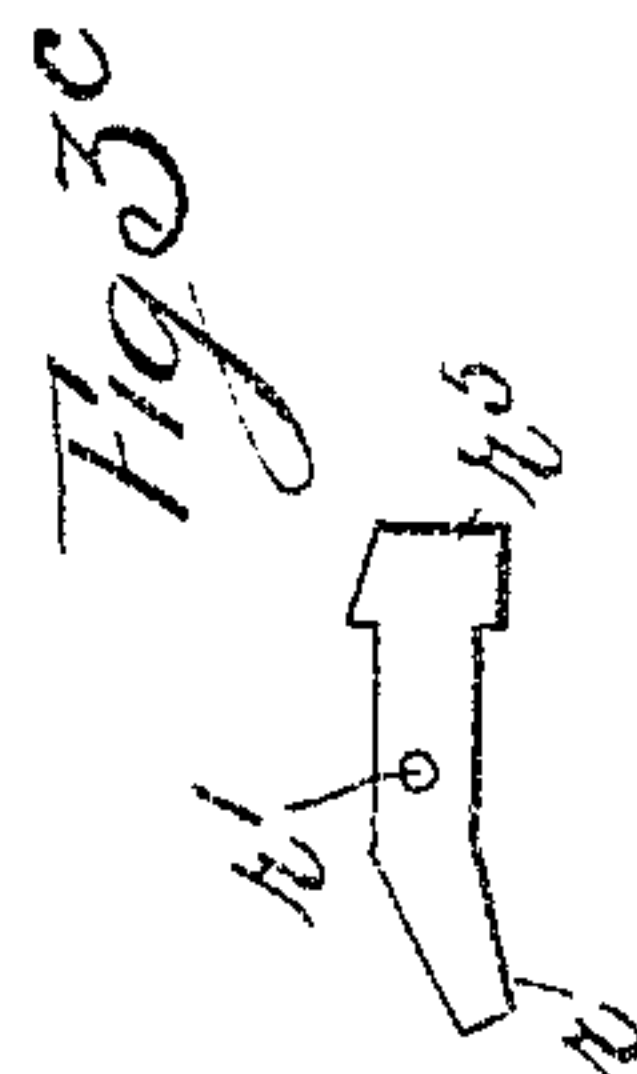
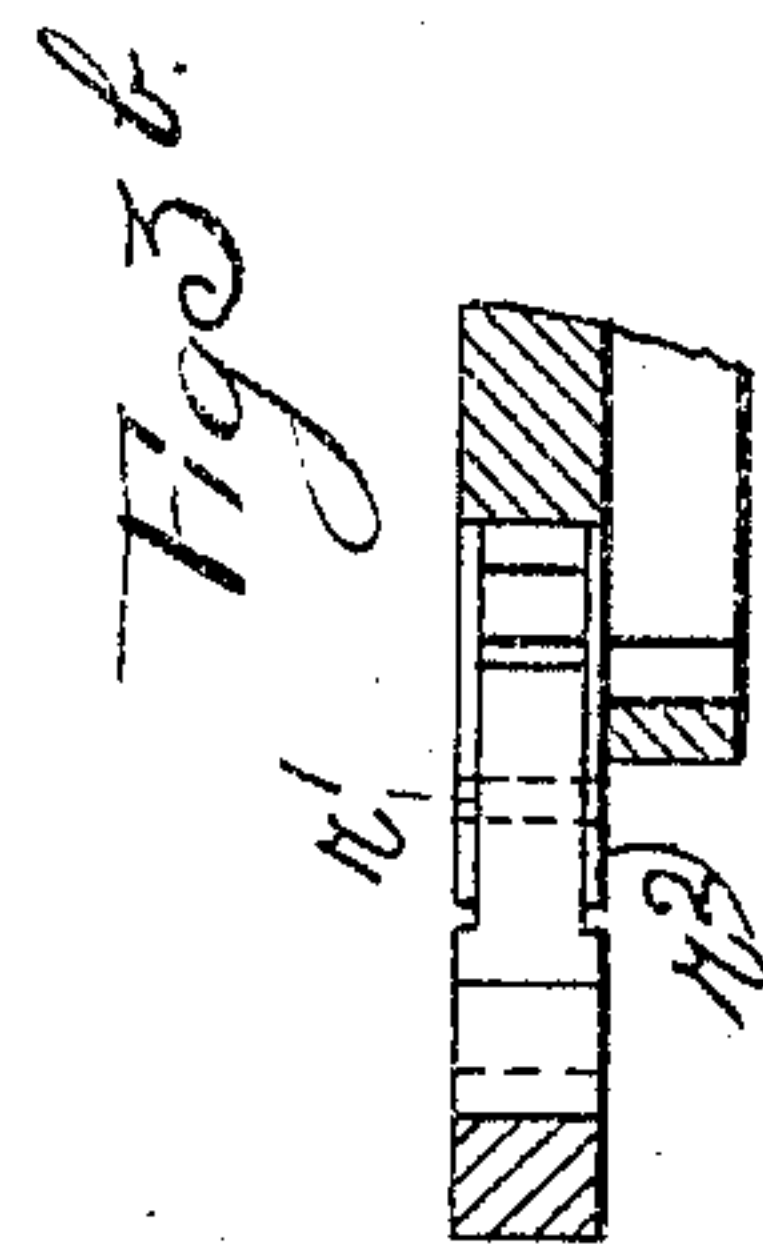
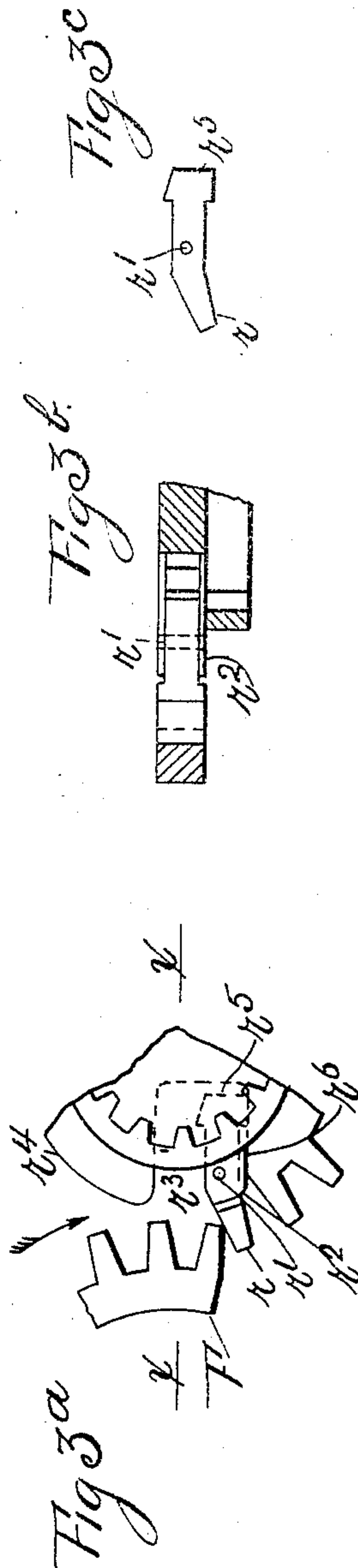
G. R. YOUNG.
TIME DAMPER APPARATUS.
APPLICATION FILED MAR. 14, 1904.

4 SHEETS—SHEET 3.



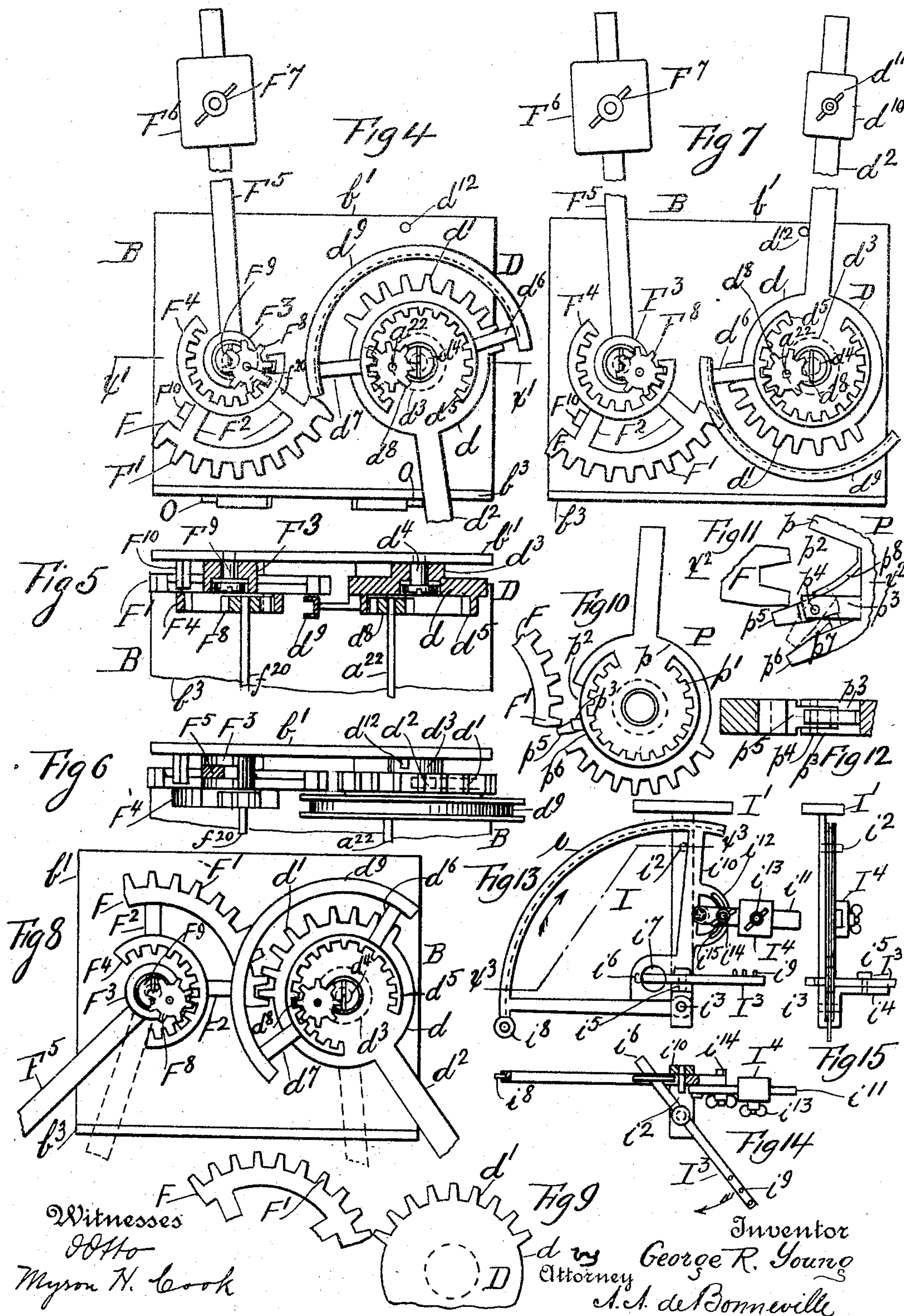
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G. R. YOUNG.
TIME DAMPER APPARATUS.
APPLICATION FILED MAR. 14, 1904.

4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

GEORGE R. YOUNG, OF RIDGEWOOD, NEW JERSEY.

TIME DAMPER APPARATUS.

SPECIFICATION forming part of Letters Patent No. 781,170, dated January 31, 1905.

Application filed March 14, 1904. Serial No. 198,062.

To all whom it may concern:

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

This invention relates to time damper apparatus, and has for its object means with which
10 the draft appurtenances, dampers, valves, or doors of a furnace, heater, boiler, and the like can be both opened and closed by time-releasing apparatus or mechanism.

The organization of the invention is characterized by embodying the double function
15 of both opening and checking or checking and opening or either opening or checking independently of each other the draft of a furnace, heater, and the like by operating in
20 conjunction with time release mechanism such as is embodied in an ordinary clock or other timepiece and the like.

The essential elements of the invention are a timepiece with release mechanisms, and a movable support arranged to be moved by one or
25 both of said mechanisms. The movable support is weighted so as not to quite counterbalance the weights of the dampers, doors, and the like connected therewith, thereby enabling its change of position when released
30 by a time-release mechanism. A second release mechanism in the timepiece also coacts with the movable support, reversing the position of the movable support and the appurtenances after having moved with the first release mechanism.

This invention is a companion patent to my application, Serial No. 138,687, filed January 12, 1903.

40 In the drawings, Figure 1 represents an elevation of the invention applied to a steam-heater on a reduced scale. Fig. 2 is a front elevation of a portion of the appurtenances directly connected to a timepiece, the latter
45 having only the release mechanisms shown and a section of Fig. 3 as on the line $y y$. Fig. 3 shows a partial top view of Fig. 2. Fig. 3^a represents a partial front view of a fragmentary modified portion of the appurtenances
50 connected with the timepiece. Fig. 3^b is a

section of Fig. 3^a on the line $x x$. Fig. 3^c is a front view of one of the elements shown in Fig. 3^a. Fig. 4 represents an elevation of the movable support, on a scale somewhat smaller than the size of Fig. 2, with its directly-ac-
55 companying appurtenances. Fig. 5 shows a section of Fig. 4 on the line $x' x'$. Fig. 6 is a partial top view of Fig. 4. Figs. 7 and 8 are reproductions of Fig. 4 with the positions of the moving elements changed. Fig. 9 represents a partial reproduction of Fig. 4 with
60 further changed positions for the movable elements. Fig. 10 shows a partial reproduction of Fig. 4 with a modification. Fig. 11 is a portion of Fig. 10 on an enlarged scale. Fig. 12 represents a section of Fig. 11 on the
65 line $x^2 x^2$. Fig. 13 is an elevation of a counterweighted bell-crank. Fig. 14 is a section of Fig. 13 on the line $x^3 x^3$. Fig. 15 shows a side view of Fig. 13.
70

Referring to Figs. 1, 4, and 7 particularly, a timepiece A is shown fastened to a bracket B by means of screws b , that enter legs C of the said timepiece. A movable support D is pivoted to the vertical leg b' of the bracket B,
75 a stop d^{12} , extending from the said bracket, preventing it to be turned to quite a vertical position, and the support is geared with one of the release mechanisms, of which latter the key D' is a portion. A driving-sector F is
80 also pivoted to the vertical leg b' of the bracket B and is prevented from assuming a vertical position by the stop F^{10} , which extends from the said bracket. It is in gear with a second release mechanism, of which
85 latter the key F' is a portion. A chain H extends from curved guide d^9 of the movable support D to a pulley H² and then leads to the guide i of the bell-crank I. A chain j extends from the said bell-crank I and leads to
90 the front door J of steam-heater J J. A movable lever I³ is pivoted on the bell-crank I, the end of the lever carrying a chain k' , that leads over a pulley L and connects with the rear damper M. The said chain k' also con-
95 nects with one end of the counterweighted lever m of the regulator M', and a chain m^2 leads from the opposite end of the lever m to the draft-door N.

Referring now particularly to Figs. 2 and 100

3, the front and rear frame-plates A' A^2 of the timepiece A are shown to support the hour-post a , on which latter is mounted the spur-gear a' , which meshes with the pinions a^2 and f , the former meshing with the gear a^4 and the latter with the gear f' . The spindle a^5 of the gear a^4 carries the pinion a^6 , that meshes with the gear a^7 , and the latter meshes with the pinion a^8 , the spindle a^9 of which carries the key D' . The spindle f^2 of the gear f' carries the pinion f^3 , that meshes with the gear f^4 , the latter meshing with the pinion f^5 , the spindle f^6 of the latter supporting the key F' . On the spindle a^5 there is carried a ring a^{10} with a beveled hook a^{11} . From wheel a^4 projects the barrel a^{12} , and both the latter can move along the axis of the spindle a^5 . A spring a^{13} presses the said wheel, with barrel, outwardly in direction of the arrow. The barrel a^{12} is suitably notched for the said hook a^{11} , and while the gear a^4 , with its barrel, is being propelled by the train of gearing from the hour-post a , the hook a^{11} bearing against the said barrel, the wheel a^4 maintains the end a^{14} of the spring a^{13} against a fan-wheel a^{15} , through an opening in the plate A' . When the notch in the barrel a^{12} comes opposite the hook a^{11} , the wheel a^4 , with its barrel, moves along its axis in the direction of the arrow, and the end a^{14} of the spring a^{13} releases the fan-wheel a^{15} . The said fan-wheel a^{15} is supported on the spindle a^{16} , which also carries the pinion a^{17} , that meshes with the gear a^{18} , carried on the spindle a^{19} , and on the latter is secured the pinion a^{20} , that meshes with the gear a^{21} , that fits loosely on its spindle a^{22} . A ratchet-wheel a^{23} is fastened to the spindle a^{22} , and a pawl a^{24} , with its spring a^{25} , is carried on the wheel a^{21} . On the spindle f^2 there is carried a ring f^7 , from which projects a beveled hook f^8 , and the spur-gear f' carries the barrel f^9 , that is notched for the hook f^8 . A spring f^{10} , with one of its ends fastened to the plate A' and its free end f^{11} capable of extending through an opening in the said plate, can engage with a fan-wheel f^{13} . The body portion of the spring bears against the wheel f' to press it forward along its axis in the direction of the arrow, and when the hook f^8 by virtue of the turning of the wheel f' engages in the notch of the barrel f^9 the spring f^{10} releases the fan-wheel f^{13} . On the spindle f^{14} of the fan-wheel there is mounted the pinion f^{15} , that meshes with the spur-gear f^{16} , and on the spindle f^{17} of the latter there is located the pinion f^{18} , that meshes with the gear f^{19} , which latter is loose on the spindle f^{20} . A ratchet-wheel f^{21} is fastened to the spindle f^{20} , and a pawl f^{22} , with its spring f^{23} , is carried on the spur-gear f^{19} .

Referring now particularly to Figs. 2 to 12, the movable support D is shown to comprise the disk d , with the teeth d' extending from a portion of its circumference. A handle d^2 extends from the said disk, and a hub d^3 projects

from the middle portion thereof. A pivot d^4 extends through the hub and is secured in the vertical member b' of the bracket B . From the disk d extends the internal gear d^5 and the arms d^6 d^7 , which latter support the curved guide d^9 . A counterweight d^{10} is adjustably secured to the handle d^2 by means of the screw d^{11} . The driving-sector F , with teeth F' , is supported by the arms F^2 , extending from the hub F^3 , and the said arms also support the internal gear F^4 . The handle F^5 extends from the hub F^3 and has the counterweight F^6 adjustably secured thereon by means of the screw F^7 . A pivot F^9 holds the sector, with its appurtenances, to the vertical member b' of the bracket B . A pinion F^8 on the spindle f^{20} , which latter extends through the frame-plate A^2 of the timepiece, meshes with the internal gear F^4 , and a pinion d^8 on the spindle a^{22} meshes with the internal gear d^5 , the spindle a^{22} also passing through the said plate A^2 . The lower and horizontal member b^3 of the bracket B has the openings b^2 b^5 to respectively allow the handles F^5 d^2 to swing therein and the opening b^4 to permit the chain H to pass therethrough. Buffers with plungers O and springs O' are secured to the member b^3 in the openings b^2 and b^5 to prevent jar when the handles F^5 and d^2 are dropped.

In Figs. 10 to 12 there is shown a modification of the movable support, which in this case is designated by the letter P . The disk portion p , as before, carries an internal gear p' , but has a cavity p^2 , on the sides of which extend the lugs p^3 for the pin p^4 , that carries the movable tooth p^5 . A tooth p^6 adjacent to the tooth p^5 has extending therefrom the stop p^7 , and a spring p^8 extends from a wall of the cavity p^2 and bears on the rear end of the said movable tooth. The driving-sector F remains the same, and one of its end teeth F' is shown in contact with the movable tooth p^5 .

Referring now to Figs. 1 and 13 to 15, the bell-crank I is pivoted in a hanger I' , which has extending from its upper end the pin i^2 and at its lower portion is made U -shaped for the pin i^3 . The leg i^4 extends horizontally from its vertical portion and has a pin i^5 for a lever I^3 , which has one of its ends i^6 extending through an opening i^7 , formed near the apex of the bell-crank I . A curved guide i unites the arms of the bell-crank, and an eyelet i^8 is formed at one end thereof. Holes or pins i^9 for securing the chain k' are at the free end of lever I^3 . It will be evident that when the bell-crank is raised in the direction of the arrow, Fig. 13, that the chain H , Fig. 1, will move up and that the free end of the lever I^3 will move in the direction of the arrow shown in Fig. 14. On the arm i^{10} of the crank I is pivoted a lever i^{11} , arranged to swing over a sector i^{12} , extending from the arm i^{10} . A weight I^4 can be secured in different positions on the arm i^{11} by means of the

thumb-screw i^{13} , and the arm can be adjustably secured on the sector i^{12} by means of the bolt i^{14} , clamping the arm i^{11} in various positions by virtue of the slot i^{15} in the said sector.

5 To operate the invention, it is customary to arrange the elements to operate in one direction at a predetermined time and in an opposite direction in an interval thereafter. We will first suppose that the draft is closed, as shown in Fig. 1, and that it is desired to first
10 open the draft and then to close it. To open the draft, the chain H must be lowered, and to check the draft it must be again raised. To obtain the location and disposition of the elements shown in Fig. 1, the movable support
15 D must have been turned down to the right, with its teeth out of mesh with the teeth of the driving-sector F. It can be turned to this position without coacting with the fan-wheel, as the ratchet-wheel a^{23} in turning to the
20 right with the handle d^2 slips away from the pawl a^{21} on the wheel a^{21} . The pointer on the dial D^2 having now been set at a predetermined time the hook a^{11} will enter the depression in the barrel a^{12} at the said time by
25 the operation of the train of gearing between the hour-post a and the barrel a^{12} . This permits the hook end a^{14} of the spring a^{13} to become disengaged from the fan-wheel a^{15} , allowing the latter to turn, and with it the train
30 of gearing, between the said fan-wheel and the gear 21 and pinion d^8 , permitting the handle d^2 to be pulled up by reason of the weight supported by the chain H. The said chain H
35 is lowered, and the movable support will take the position shown in Fig. 7. The driving-sector F we have supposed to be turned to the position shown in Fig. 1, and which can be secured by hand, as in turning from left to
40 right the ratchet-wheel f^{21} turns under and away from the pawl f^{22} . It will be noted that the teeth d' and F' are out of line of contact with each other. The next operation will be to raise the chain H, and the pointer of the
45 dial F'' having been set at a predetermined time when the hour-post by means of the gearing between the same and the barrel f^9 brings the depression in the latter opposite the hook f^8 the hook end f^{11} of the spring f^{10} releases the
50 fan-wheel f^{13} , and the weight F^6 being sufficiently heavy throws the handle F^5 to the left, so that the driving-sector turns up, and with it the toothed support D, both as shown in Fig. 9, and the chain H is raised, as required.
55 In Fig. 8 the position of the elements show the last tooth of the driving-sector engaged with the last tooth of the movable support as they are both turning up to become disengaged, and when the relative positions are obtained, as
60 shown in Fig. 9, the teeth will be well clear of each other on account of the momentum of the moving elements. We will now suppose the draft to be open, with the dampers in positions opposite to those shown in Fig. 1, and
65 it is required to check the draft, and then open

it again. In such a case the door J and damper M will be found closed and the door N open. The first operation of the apparatus will be to raise the chain H and afterward to lower it. To start with, the moving elements will have
70 to be located, as shown in Fig. 7, and if they are not so disposed the driving-sector can be so located—that is, turned up by the ratchet-wheel f^{21} sliding under the pawl f^{22} when raising the handle F^5 . If the handle d^2 is down,
75 it can be raised by hand by first disengaging the spring a^{13} and the fan-wheel a^{15} and engaging them again when the handle d^2 has been raised by means of the key D' . The elements can now be supposed located, as shown in Fig.
80 7, and both release mechanisms having been properly set, the one connected with the fan-wheel f^{13} to operate before the one connected with the fan-wheel a^{15} and at the predetermined time the hook f^{11} of the spring f^{10} will become
85 disengaged from the fan-wheel f^{13} , when the weight F^6 will pull down the handle F^5 and the elements F and D will move to the positions shown in Fig. 9, the release mechanism to the right not becoming disturbed and the
90 ratchet-wheel a^{23} sliding under the pawl a^{21} to permit the handle d^2 to turn down and raise the chain H.

It will be noted that the element D is so counterweighted that the appurtenances at the
95 furnace end of the chain H tend to pull the latter down when the said element is in a position as shown in Fig. 9, and when the spring a^{13} becomes disengaged from the fan-wheel a^{15} the handle d^2 will turn up and the chain H will
100 be lowered.

In case the moving elements are located as shown in Fig. 9 and the movable support D is first pulled up to the position shown in Fig. 7 by disengaging the fan-wheel coacting with the
105 support D, if it happens to be engaged therewith, and then it is desired to turn up the handle F^5 , which can be done whether the fan-wheel f^{13} is engaged or disengaged by the spring f^{10} by virtue of ratchet-wheel f^{21}
110 sliding under its pawl, it will be found that the teeth F' of the sector F cannot pass the teeth d' of the movable support D, and to obviate this difficulty the movable support is modified, as shown in Figs. 3^a, 3^b, 3^c, or as
115 shown in Figs. 10, 11, and 12, which latter has already been described. In Figs. 3^a, 3^b, 3^c a tooth like r of the removable support is pivoted on a pin r' , secured in the lugs r^2 , that extend on the sides of a cavity r^3 , formed in
120 the disk portion r^4 of the movable support. The tooth is extended beyond the pin r' to overbalance the front portion of the tooth, so that when the support is in the position shown in Fig. 7 or Fig. 3^a the rear portion r^5 will im-
125 pinge against the lower surface r^6 of the said cavity to be always in proper position when the moving elements are disposed as shown in Fig. 7 and the like—that is, when the driving-sector F is to engage the movable support to
130

turn it from the position shown in Fig. 7. Now when, as shown particularly in Fig. 3^a, the sector F is moving in the direction of the arrow shown in said figure it will depress the
 5 pivoted tooth *r* out of the way, and when the sector F has passed beyond the tooth *r* the latter will assume its normal position.

It is evident that the movable support D can be placed in the position shown in Fig. 4
 10 and used for lowering the chain H without any relation to the driving-sector F.

Having described my invention, I claim—

1. The combination with a timepiece of two
 15 release mechanisms; a pivoted movable support coacting with one of said release mechanisms; a pivoted driving-sector coacting with the second release mechanism, and arranged to engage the movable support to move the latter while still engaged with its release mechanism; gravity moving the movable support
 20 in an opposite direction, when disengaged from its release mechanism.

2. The combination with a timepiece of two release mechanisms, a pivoted support geared
 25 with one of said release mechanisms, a driving-sector geared with the other release mechanism, and arranged to also gear with the movable support, and draft-controlling appurtenances connected with the movable support.

30 3. The combination with a timepiece of two release mechanisms, spindles of the release mechanisms extending from the timepiece, a pinion on each spindle outside of the timepiece, a pivoted support, teeth on the support
 35 meshing with one of said pinions, a driving-sector, teeth on the driving-sector meshing with the other of said pinions, teeth on the driving-sector arranged to mesh with the teeth on the pivoted support.

40 4. The combination with a timepiece of two release mechanisms, a pivoted support arranged to be held and released by one of said release mechanisms, a pivoted driving-sector arranged to be held and released by the other
 45 release mechanism, the movable support arranged to be moved by the driving-sector, and draft-controlling appurtenances connected with the movable support.

50 5. The combination with a timepiece of two release mechanisms, a pivoted movable support connected with and arranged to actuate in conjunction with one of said release mechanisms, a driving-sector connected with and arranged to actuate in conjunction with the other
 55 release mechanism, the driving-sector arranged to actuate the pivoted support, a furnace, draft-controlling appurtenances on the furnace, connections between said appurtenances and the said pivoted support.

60 6. The combination with a timepiece of two release mechanisms; a pivoted support arranged to coact with one of said mechanisms; a driving-sector arranged to coact with the other release mechanism; a furnace; a draft-
 65 controlling damper and door on the furnace;

a bell-crank connected up between the said damper and door, and the pivoted support; a lever on the bell-crank arranged to swing by the swinging of the bell-crank, and in a plane
 70 different from the plane of oscillation of the bell-crank, the bell-crank directly controlling and moving the door of the furnace, and the lever controlling and moving the damper of the furnace.

7. The combination with a timepiece of two
 75 release mechanisms, a pivoted support geared with one of said mechanisms, a pivoted driving-sector geared with the other release mechanism, means to gear the said support and driving-sector to each other, a furnace,
 80 two elements comprising a damper and a door on the furnace to control the draft thereof, a bell-crank connected up between the said support and the said elements, a lever pivoted on the bell-crank, the latter having an opening
 85 for one end of the lever, a chain leading from the other end of the lever to one of said elements, a chain leading from the bell-crank to the other element, and a counterweight on the
 90 bell-crank.

8. The combination with a timepiece of two release mechanisms, a pivoted movable support geared with one of said release mechanisms, a driving-sector geared with the other
 95 release mechanism and capable of gearing with the movable support, a furnace, draft-controlling appurtenances on the furnace, a chain connecting the said pivoted movable support and the said appurtenances.

9. The combination with a timepiece of two
 100 release mechanisms, spindles of the release mechanisms extending outside of the timepiece, pinions carried on said spindles, a bracket supporting the timepiece, a movable support pivoted to the bracket, teeth on the
 105 movable support in mesh with one of the said pinions, a driving-sector pivoted to the movable support, teeth on the driving-sector in mesh with the other pinion and teeth on the driving-sector capable of meshing with teeth
 110 on the movable support, draft-controlling appurtenances, and connections between said appurtenances and the movable support.

10. The combination with a timepiece of two
 115 release mechanisms, spindles on the release mechanisms extending outside of the timepiece, pinions carried on said spindles, a bracket supporting the timepiece, a movable support pivoted on the bracket, a handle extending from the support, a stop on the bracket
 120 for the support, a driving-sector pivoted to the bracket, a handle extending from the sector, a counterweight on the latter handle, a stop on the bracket for the driving-sector, teeth on the driving-sector and teeth on the
 125 said support, the two latter elements disposed that their teeth may mesh to swing the support by the swinging of the said sector, and arranged so that the movable support can swing clear of the driving-sector.
 130

11. The combination with a timepiece of two
release mechanisms, spindles on the release
mechanisms extending outside of the time-
piece, pinions carried on said spindles, a
5 bracket supporting the timepiece, two ele-
ments comprising a movable support and a
driving-sector both pivoted to the bracket,
teeth on the said elements arranged to mesh
with each other, one of the teeth movable on
10 one of the elements, to allow one of said ele-
ments to drive the other in one direction, and
pass it in an opposite direction without mov-
ing the same.

12. The combination with a timepiece of two
15 release mechanisms, spindles on the release
mechanisms extending outside of the time-
piece, pinions carried on said spindles, a
bracket supporting the timepiece, a movable
support pivoted on the bracket, a driving-sec-
20 tor pivoted to the bracket, teeth on the said
sector arranged to mesh with teeth on the said
support, a tooth on the movable support ar-
ranged to swing on a pivot carried on the said
support, allowing the driving-sector to move
25 by the said support in one direction without
driving the said support, and meshing with
the driving-sector when moving in an oppo-
site direction to move the said support.

13. The combination with a timepiece of two
30 release mechanisms, spindles on the release
mechanisms extending outside of the time-
piece, pinions carried on said spindles, a
bracket supporting the timepiece, a movable
support pivoted on the bracket, a driving-sec-
35 tor pivoted to the bracket, teeth on the sector
and teeth on the support, the teeth of both
arranged to mesh with each other, a tooth on
the support carried on a pivot, the said tooth
extended to the rear of its pivot, a stop for
40 the rear of the said tooth to maintain it in its
normal position, when engaged by the teeth
of the sector to turn the said support, and to
swing out of the path of the sector when the
latter is swinging in an opposite direction.

14. The combination with a timepiece of two
45 release mechanisms, spindles on the release
mechanisms extending outside of the time-
piece, pinions carried on said spindles, a
bracket supporting the timepiece, a movable
support pivoted on the bracket, a driving-
50 sector pivoted to the bracket, teeth on the
sector, and teeth on the support, the teeth of
both arranged to mesh with each other, a piv-
oted tooth on the support, an extension of the

tooth extending to the rear of the pivot there- 55
of, a stop on the movable support for the ex-
tension of the tooth, a spring bearing on the
extension of the tooth to maintain it in its
normal position.

15. The combination with a timepiece of two 60
release mechanisms, spindles on the release
mechanisms extending outside of the time-
piece, pinions carried on said spindles, a
bracket supporting the timepiece, a movable
support pivoted on the bracket, a disk on the 65
movable support, teeth extending from the cir-
cumferential edge of the disk for a portion of
its circumference, an internal gear extending
from the disk and meshing with one of the
said pinions of one of the release mechanisms, 70
a handle projecting from the disk, and a guide
for a chain carried by the said disk, a driving-
sector pivoted to the bracket, teeth on the
sector arranged to be capable of meshing with
the teeth of the movable support, an internal 75
gear carried on the sector meshing with the
pinion of the other release mechanism, and a
handle with a counterweight extending from
the driving-sector.

16. The combination with a timepiece of two 80
release mechanisms, spindles on the release
mechanisms extending outside of the time-
piece, pinions carried on said spindles, a
bracket supporting the timepiece, a movable
support pivoted on the bracket, a disk on the 85
movable support, teeth extending from the
circumferential edge of the disk for a portion
of its circumference, an internal gear extend-
ing from the disk meshing with one of the
pinions of one of the release mechanisms, a 90
handle projecting from the disk, and a guide
for a chain carried by the said disk, a driving-
sector pivoted to the bracket, teeth on the
sector arranged to be capable of meshing with
the teeth of the movable support, an internal 95
gear carried on the sector meshing with the
pinion of the other release mechanism, a
handle with a counterweight extending from
the driving-sector, and buffers on the brack-
ets for the handles of the said support and 100
driving-sector.

Signed at the borough of Manhattan, in the
county of New York and State of New York,
this 10th day of March, A. D. 1904.

GEORGE R. YOUNG.

Witnesses:

O. OTTO,
R. W. TODD.