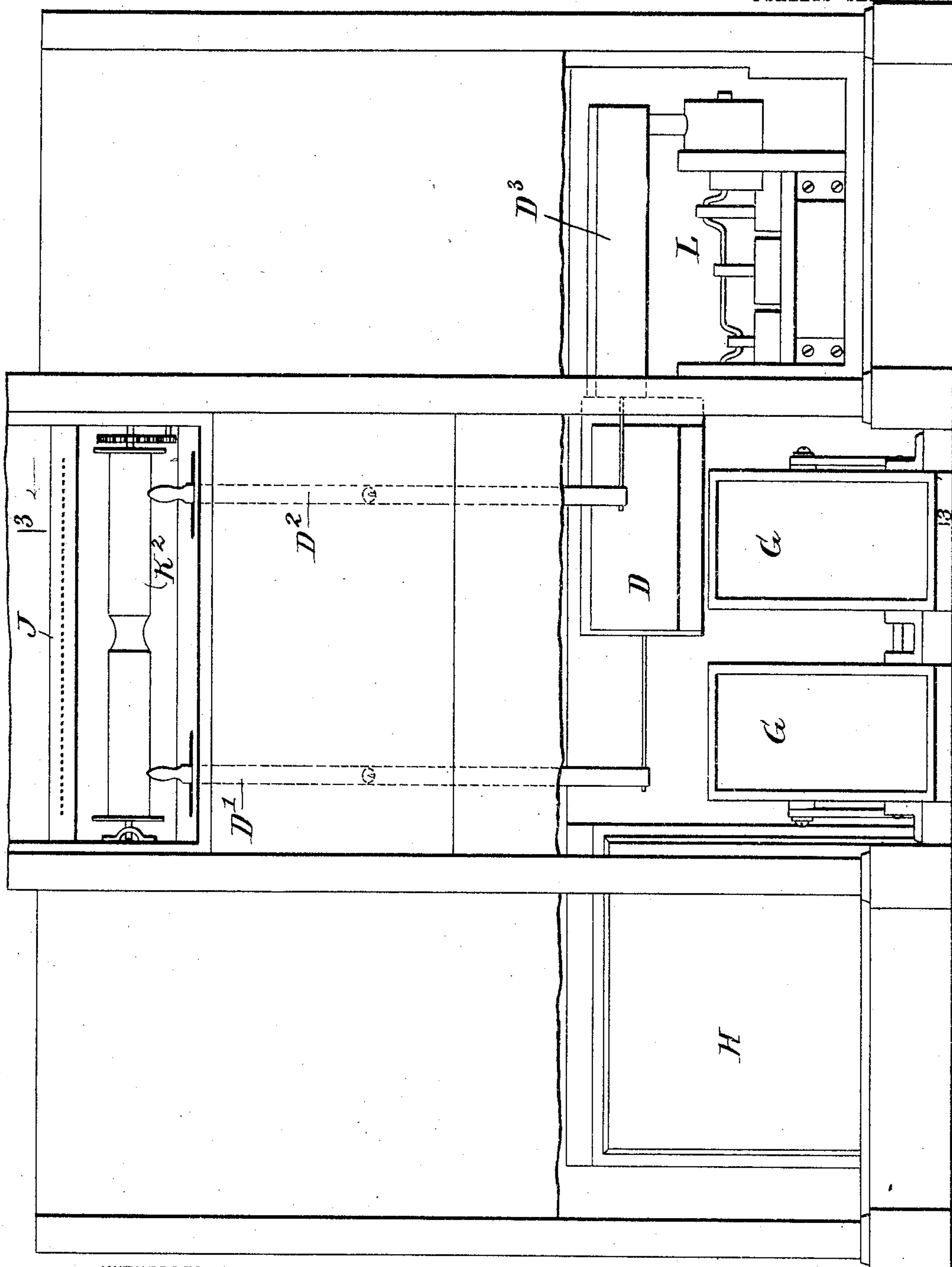


No. 785,509.

PATENTED MAR. 21, 1905.

H. MEYER.
COMPENSATING DEVICE.
APPLICATION FILED DEC. 1, 1904.

4 SHEETS—SHEET 1



WITNESSES:

Edward Thorpe
Rev. J. Koster

Fig. 1,

INVENTOR

Hermann Meyer

BY

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ATTORNEYS

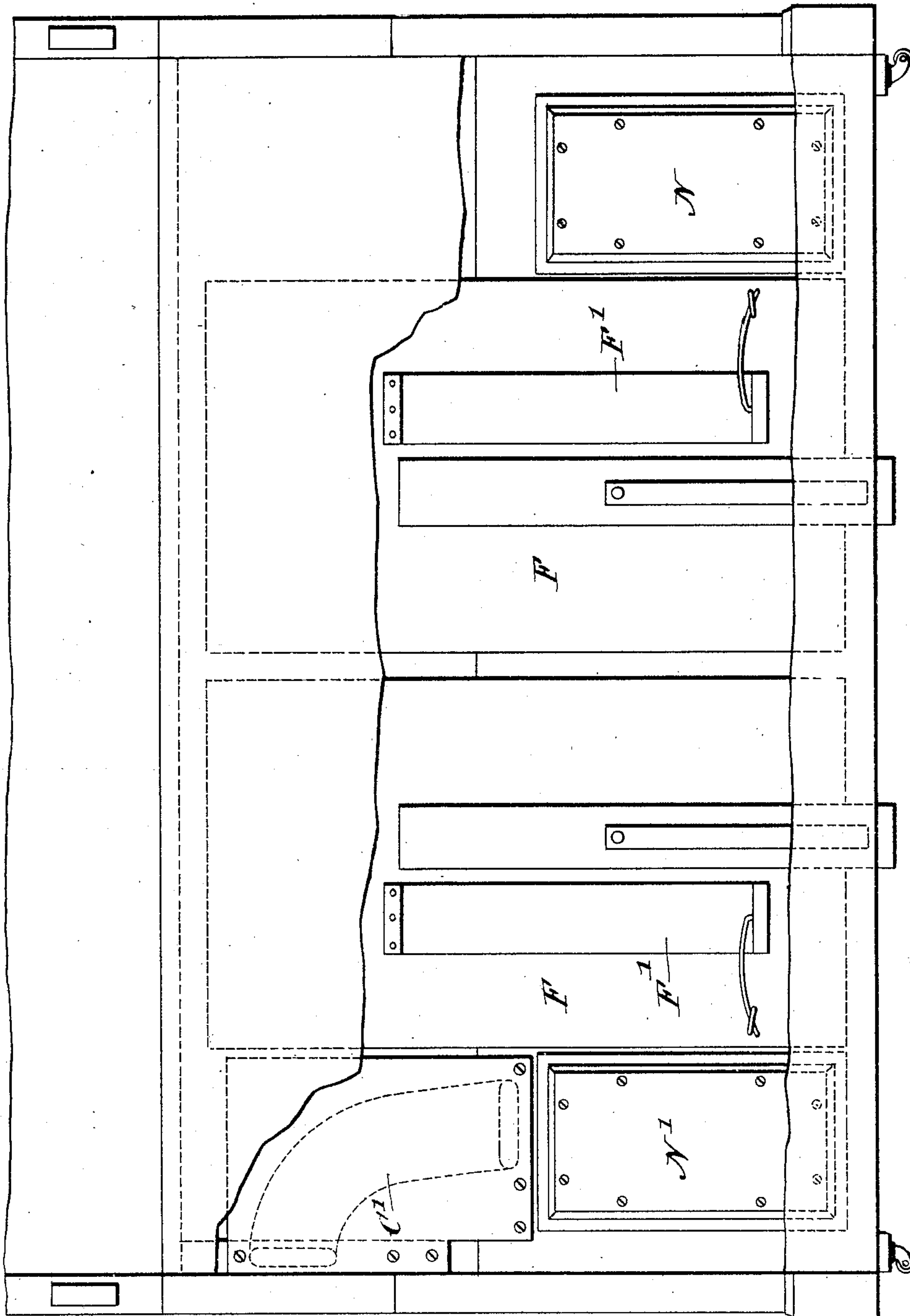
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4 SHEETS—SHEET 2.

Fig. 2.



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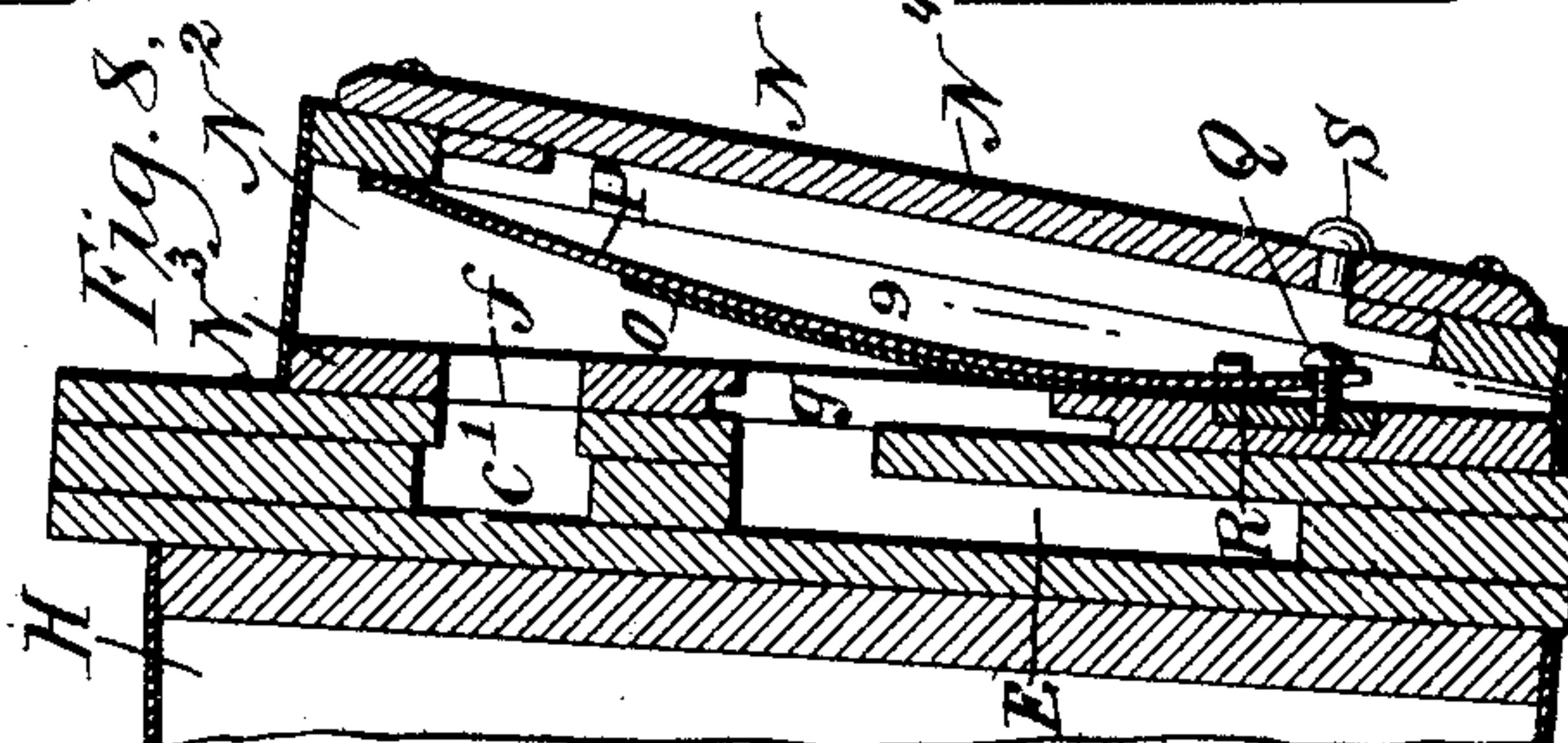
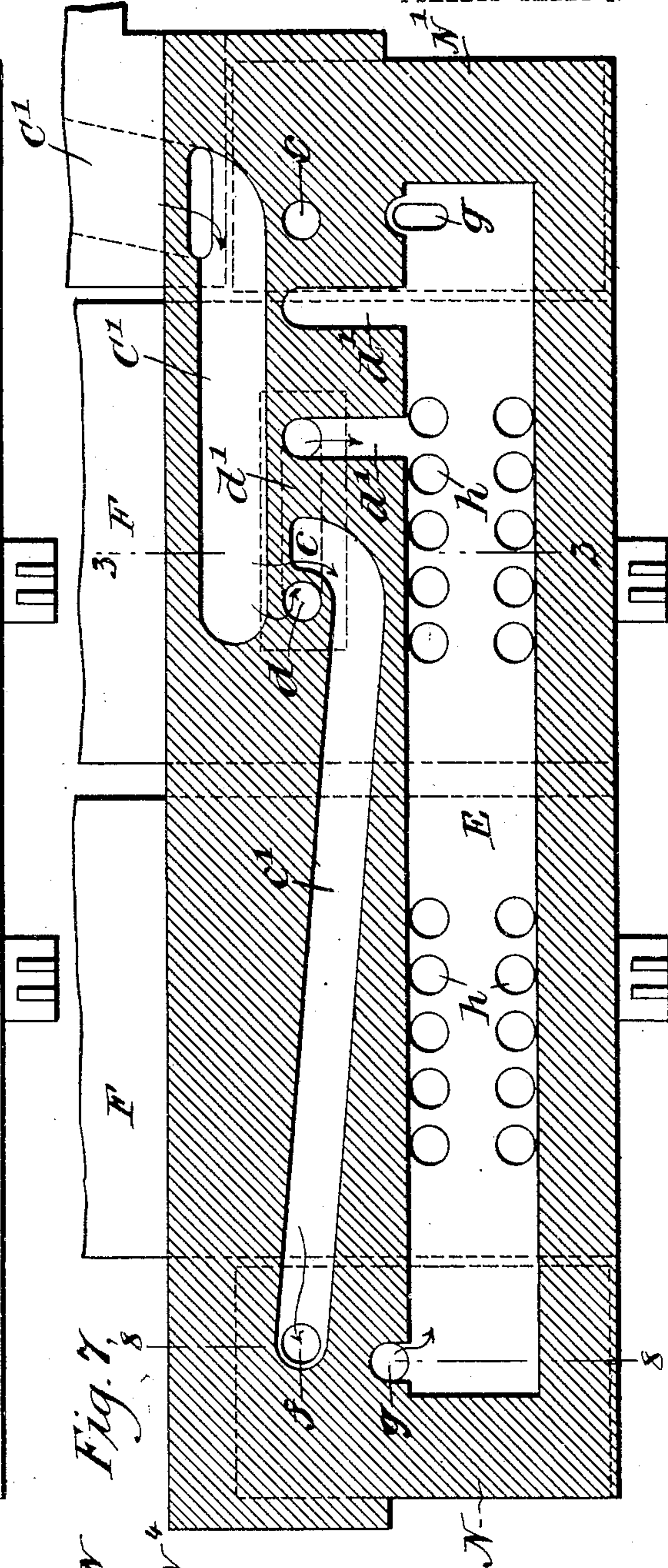
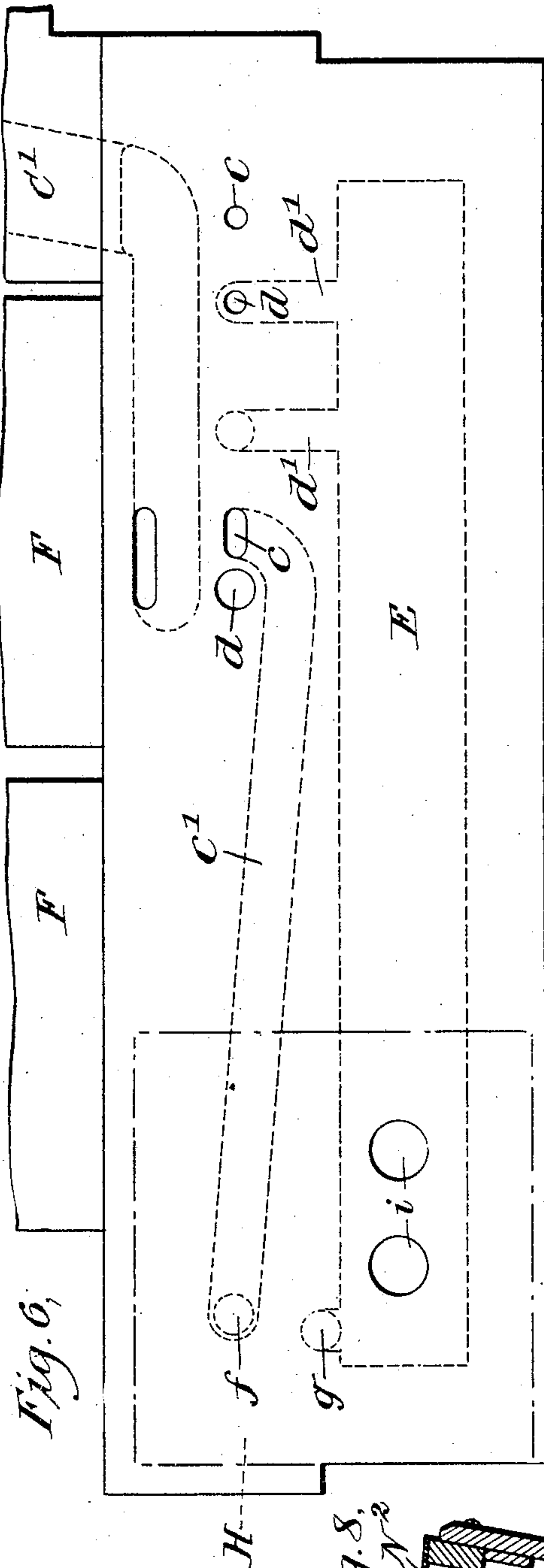
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APPLICATION FILED DEC. 1, 1904.

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UNITED STATES PATENT OFFICE.

HERMANN MEYER, OF NEW YORK, N. Y.

COMPENSATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 785,509, dated March 21, 1905.

Application filed December 1, 1904. Serial No. 235,043.

To all whom it may concern:

Be it known that I, HERMANN MEYER, a citizen of the United States, and a resident of the city of New York, borough of the Bronx, in the county and State of New York, have invented a new and Improved Compensating Device, of which the following is a full, clear, and exact description.

The invention relates to organs, self-playing pianos, automatic self-players, and like instruments; and its object is to provide certain new and useful improvements in compensating devices for such instruments whereby undue vibration is prevented by giving a uniform tension to the suction-bellows, thus compensating for the irregular amount of air drawn through the tracker-board, according to the perforations of the note-sheet, compensating for the variation in speed required for moving the note-sheet over the tracker-board, and compensating for the irregular movement given by the performer to the pedals for actuating the suction-bellows.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a front elevation of an automatic self-player provided with the improvement, parts of the front of the casing being broken out. Fig. 2 is a rear elevation of the same, part of the back of the casing being broken away. Fig. 3 is a cross-section of the same on the line 3 3 of Figs. 1 and 7. Fig. 4 is an enlarged rear face view of the controlling-valve. Fig. 5 is a sectional plan view of the same on the line 5 5 of Fig. 4. Fig. 6 is an enlarged front view of the improvement, the reservoir and valves being removed. Fig. 7 is a similar view of the same on the line 7 7 of Fig. 3. Fig. 8 is an enlarged cross-section on the line 8 8 of Fig. 7 of the compensating device, and Fig. 9 is a rear sectional elevation of part of the same on the line 9 9 of Fig. 8.

The automatic piano-player on which the improvement is shown applied is in its general

construction similar to the one represented in the Letters Patent of the United States No. 756,674, granted to me April 5, 1904, so that a full detailed description of the same is not deemed necessary, it being understood, however, that the key-strikers A are actuated by the pneumatics B, connected with pneumatic valve-chests C, connected by a duct C' and slide-valve D with the main suction-chamber E of the suction-bellows F, actuated by the operator manipulating the pedals G, the said slide-valve D being under the control of the operator manipulating the hand-lever D' and the said main suction-chamber being also connected with the usual reservoir H.

The valve-chests C are connected by flexible tubes I with a tracker-board J, over which passes a note-sheet K, unwinding from a roller K' and winding up on a roller K'', driven from a pneumatic motor L, the speed of which is governed by the operator manipulating the lever D'', controlling a valve D'', similar to the valve D and connecting the main suction-chamber E with the wind-chest of the said pneumatic motor L.

Intermediate the valves D and D'' and the main suction-chamber E are interposed compensating devices N N', respectively, both alike in construction, one being shown in detail in Figs. 8 and 9.

The duct C' connects by a port *a* (see Figs. 3 and 4) with a chamber *b*, formed in a valve-casing D', in which the valve D is mounted to slide, and from the said chamber lead ports *c* and *d*, controlled by the said valve D. The ports *c* and *d* are connected with each other by a leak-groove *e*, and opposite this leak-groove *e* is arranged a wedge-shaped recess D'', formed in the corresponding face of the slide-valve D. The port *c* leads to a channel *c'*, (see Figs. 6 and 7,) connected by a port *f* with the interior of the compensating device N, connected by a port *g* with the main suction-chamber E. The other port, *d*, has a direct connection with the main suction-chamber E by means of a channel *d'*.

The main suction-chamber E has the usual valved connections *h* with the suction-bellows F (see Figs. 3 and 7) to allow of drawing the air out of the suction-chamber on expanding the bellows and to close the said connections

on collapsing the bellows and discharging the air from the same through the usual outlet-valves F'. Ports *h* lead from the main suction-chamber E to the reservoir.

5 Each of the compensating devices N and N' consists, essentially, of a pneumatic N², having its fixed part N³ provided with ports *f* and *g*, (see Fig. 8,) of which the port *g* is elongated and controlled by a valve O, attached
10 to a leaf-spring P, located within the pneumatic and attached to one end to the fixed member N³ and pressing with its free end on the movable member N⁴ of the pneumatic, the spring thus tending to normally hold the pneumatic N² and the valve O in open positions.
15 In order to accomplish the desired result, it is necessary that the spring P be made heavy, and by having it in the form of a leaf-spring and providing a tension-adjusting device any
20 desired tension can be readily given to the spring.

The tension-adjusting device for the leaf-spring P consists of a screw Q, screwing in a plate R, secured to the fixed member N³ of
25 the pneumatic N², the said screw engaging the rear extension of the spring P, so that by screwing the screw Q inwardly the tension of the spring P is increased and by unscrewing the said screw the tension of the spring P is
30 decreased, it being understood that the spring bears on the fixed member N³ of the pneumatic N². Access to the head of the screw Q is had through an aperture fitted with a removable plug S in the movable member N³ of
35 the pneumatic. (See Fig. 8.)

When the valve D (or D³) is in a closed position, both ports *e* and *d* are closed, and hence the main suction-chamber E is cut off from
40 the wind-chest of the action or that of the motor L. In case the operator shifts either lever D' or D³ to the right a short distance then the corresponding valve D or D³ is partly opened and the chamber E is connected by the port *e*, channel *e'*, and port *f* with the interior of the
45 pneumatic N² of the corresponding compensating device N or N', and as this pneumatic is now in an open position the port *g* is opened and connects the interior of the pneumatic with the main suction-chamber E, so that air
50 is drawn out of the wind-chests by way of the corresponding compensating device, a small portion of the air, however, passing by way of the leak-groove *e* and port *d* directly into the main suction-chamber E. As the bellows
55 F are working it is evident that the suction action of the exhausted air from the pneumatic N² tends to collapse the same against the tension of the heavy spring P, and as the pneumatic closes the valve O gradually reduces the opening of the port *g* to allow less
60 air to pass out of the pneumatic in a given time, the force of the suction action being spent on the collapsing of the pneumatic against the heavy spring P thereof—that is,
65 the pneumatic flutters—and this compensates

for the small amount of air allowed to pass by the valve D, (or D³), notwithstanding the operator actuates the pedals G with the usual uniform force.

If the operator shifts the lever D' (or D³) farther to the right, then the corresponding valve D (or D³) is opened correspondingly farther and more air can pass by way of the pneumatic to the suction-chamber E, and as
70 the recess D⁵ in the valve D is now also moved in register with the leak-groove *e* it is evident that more air can pass by way of the port *d* directly into the suction-chamber E, and if the lever D' (or D³) is moved to its extreme position to the right then the valve D
75 (or D³) is opened fully—that is, both ports *e* and *d* are uncovered—to allow most of the air to pass directly by way of the port *d* into the main suction-chamber E, and but a small portion of the air passes by way of the pneumatic N² into the main suction-chamber. Now
80 when the operator desires to play pianissimo the lever D' is shifted to bring the valve D into nearly a closed position, and hence most of the air is exhausted from the wind-chests C and pneumatics B by way of the compensating device N, and when the operator desires to play forte or fortissimo the valve D is opened farther or into a full-open position,
85 so that most of the air is directly exhausted by way of the port *d* and very little air passes into the main exhaust-chamber E by way of the compensating device N. In a like manner when the operator desires to play slowly the lever D' is shifted to open the valve D³ but little, to exhaust the air slowly by way
90 of the compensating device N', and thus cause the motor L and the roller K² to run at a slow speed, and when a fast driving of the note-sheet is desired then the valve D³ is fully
95 opened to exhaust most of the air directly into the main exhaust-chamber E by way of the port *d* instead of by way of the compensating device N'.

From the foregoing it will be seen that undue vibration in the instrument is prevented
100 by allowing the operator to uniformly work the pedals and obtain a uniform tension on the suction-bellows F and reservoir H, thus compensating for the irregular amount of air drawn through the tracker-board according
105 to the perforation in the note-sheet, compensating for variation in the speed required for moving the note-sheet over the tracker-board, and compensating for any irregular movement that may be given by the performer to
110 the pedals.

Thus by the arrangement described the most minute adjustment can be had according to
115 the expression desired by the performer—that is, both as to the loudness of the tone and the duration thereof.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An instrument of the class described pro- 130

vided with a manually-controlled valve having separate connections with the main suction-chamber, one of the connections being direct, and a compensating device in the other connection.

2. An instrument of the class described, provided with a wind-chest, a main suction-chamber, a manually-controlled valve having separate connections with the main suction-chamber for controlling the passage of air from the wind-chest to the main suction-chamber, one of the connections leading directly to the main suction-chamber, and a compensating device in the other connection.

3. An instrument of the class described, provided with a wind-chest, a main suction-chamber, a manually-controlled valve having separate connections with the main suction-chamber for controlling the passage of air from the wind-chest to the main suction-chamber, one of the connections leading directly to the main suction-chamber, a compensating device in the other connection, comprising a pneumatic, and a valve for controlling the passage of the air from the compensating device to the main suction-chamber.

4. An instrument of the class described, provided with a wind-chest, a main suction-chamber, a manually-controlled valve having separate connections with the main suction-chamber for controlling the passage of air from the wind-chest to the main suction-chamber, one of the connections leading directly to the main suction-chamber, and a compensating device in the other connection, the said compensating device comprising a pneumatic, a leaf-spring for holding the pneumatic open and a valve on the said leaf-spring for controlling the passage of air from the pneumatic to the said main suction-chamber.

5. An instrument of the class described, provided with a wind-chest, a main suction-chamber, a manually-controlled valve having separate connections with the main suction-chamber for controlling the passage of air from the wind-chest to the main suction-chamber, one of the connections leading directly to the main suction-chamber, a compensating device in the other connection, the said compensating device comprising a pneumatic, a leaf-spring for holding the pneumatic open and a valve on the said leaf-spring for controlling the passage of air from the pneumatic to the said main suction-chamber, and means for adjusting the tension of the said leaf-spring.

6. An instrument of the class described, provided with a wind-chest, a main suction-chamber, a manually-controlled valve having separate connections with the main suction-chamber for controlling the passage of air from the wind-chest to the main suction-chamber, one of the connections leading directly to the main suction-chamber, and a compensating device in the other connection, the said compensating device comprising a pneumatic, a leaf-spring

within the said pneumatic and interposed between the fixed and movable parts thereof and a valve secured on the said leaf-spring and controlling the passage of the air from the pneumatic to the said main suction-chamber.

7. An instrument of the class described, provided with a main suction-chamber, a compensating device connected with the suction-chamber, a wind-chest having a suction-duct, a valve-chamber connected with the said duct and provided with spaced ports, one for connection with the said suction-chamber and the other for connection with the said compensating device, and a slide-valve in the said chamber, controlling the said ports, the slide-valve having a recess for connection with the port leading to the main suction-chamber.

8. An instrument of the class described, provided with a main suction-chamber, a compensating device connected with the suction-chamber, a wind-chest having a suction-duct, a valve-chamber connected with the said duct and provided with spaced ports, one for connection with the said suction-chamber and the other for connection with the said compensating device, and a slide-valve in the said chamber, controlling the said ports, the slide-valve having a recess for connection with the port leading to the main suction-chamber, the said recess increasing gradually in depth and in width.

9. An instrument of the class described, provided with a main suction-chamber, a compensating device connected with the suction-chamber, a wind-chest having a suction-duct, a valve-chamber connected with the said duct and provided with spaced ports, one for connection with the said suction-chamber and the other for connection with the said compensating device, the ports being connected with each other by a leak-groove, and a slide-valve in the said chamber, controlling the said ports, the slide-valve having a recess for connection with the port leading to the main suction-chamber.

10. An instrument of the class described, provided with a main suction-chamber, a compensating device provided with a pneumatic having a leaf-spring carrying a valve controlling a port connected with the suction-chamber, a wind-chest having a suction-duct, a valve-chamber connected with the said duct and provided with spaced ports, one for connection with the said suction-chamber and the other for connection with the said compensating device, and a slide-valve in the said chamber, controlling the said ports, the slide-valve having a recess for connection with the port leading to the main suction-chamber.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HERMANN MEYER.

Witnesses:

THEO. G. HOSTER,

EVERARD BOLTON MARSHALL.