

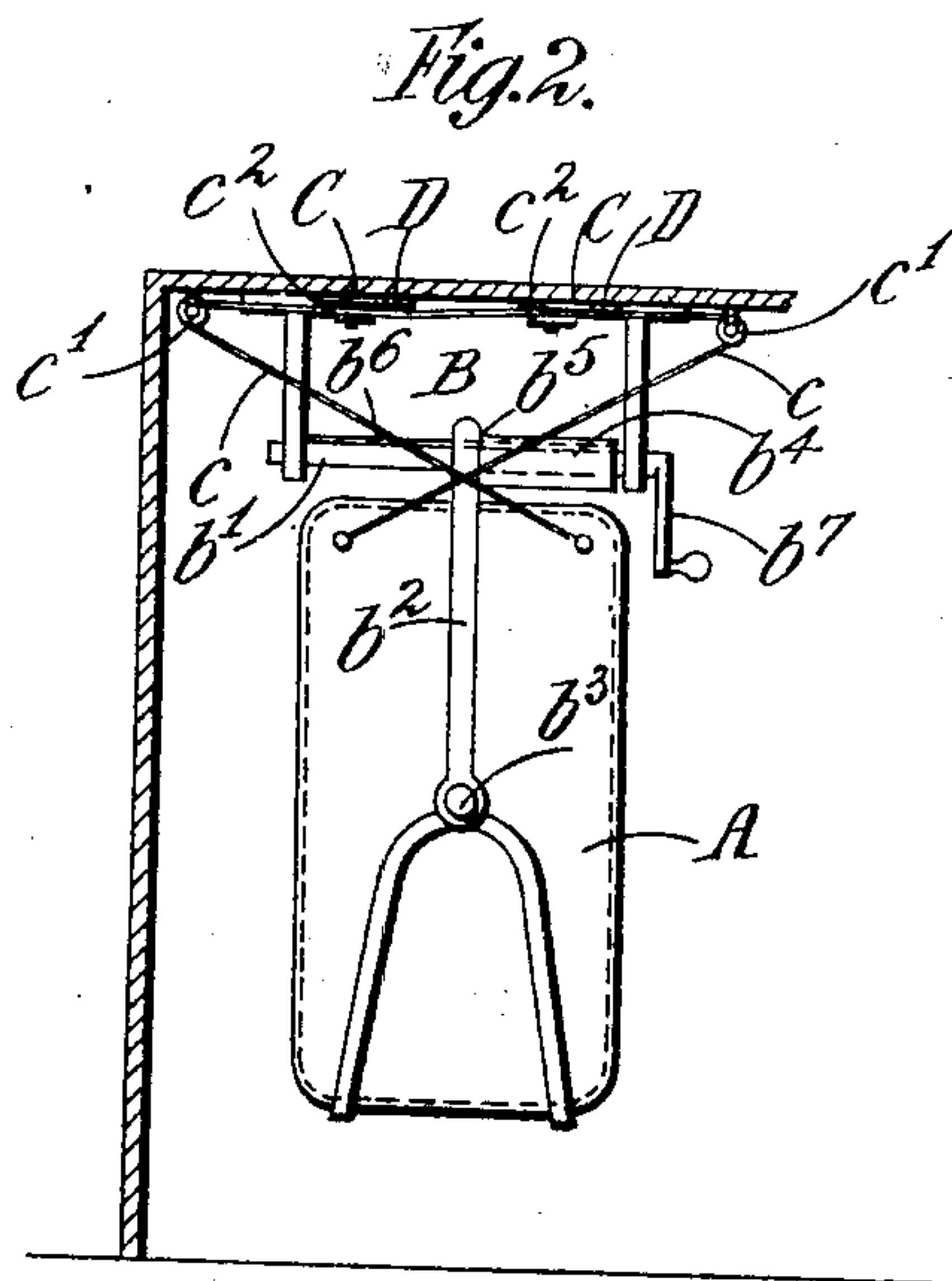
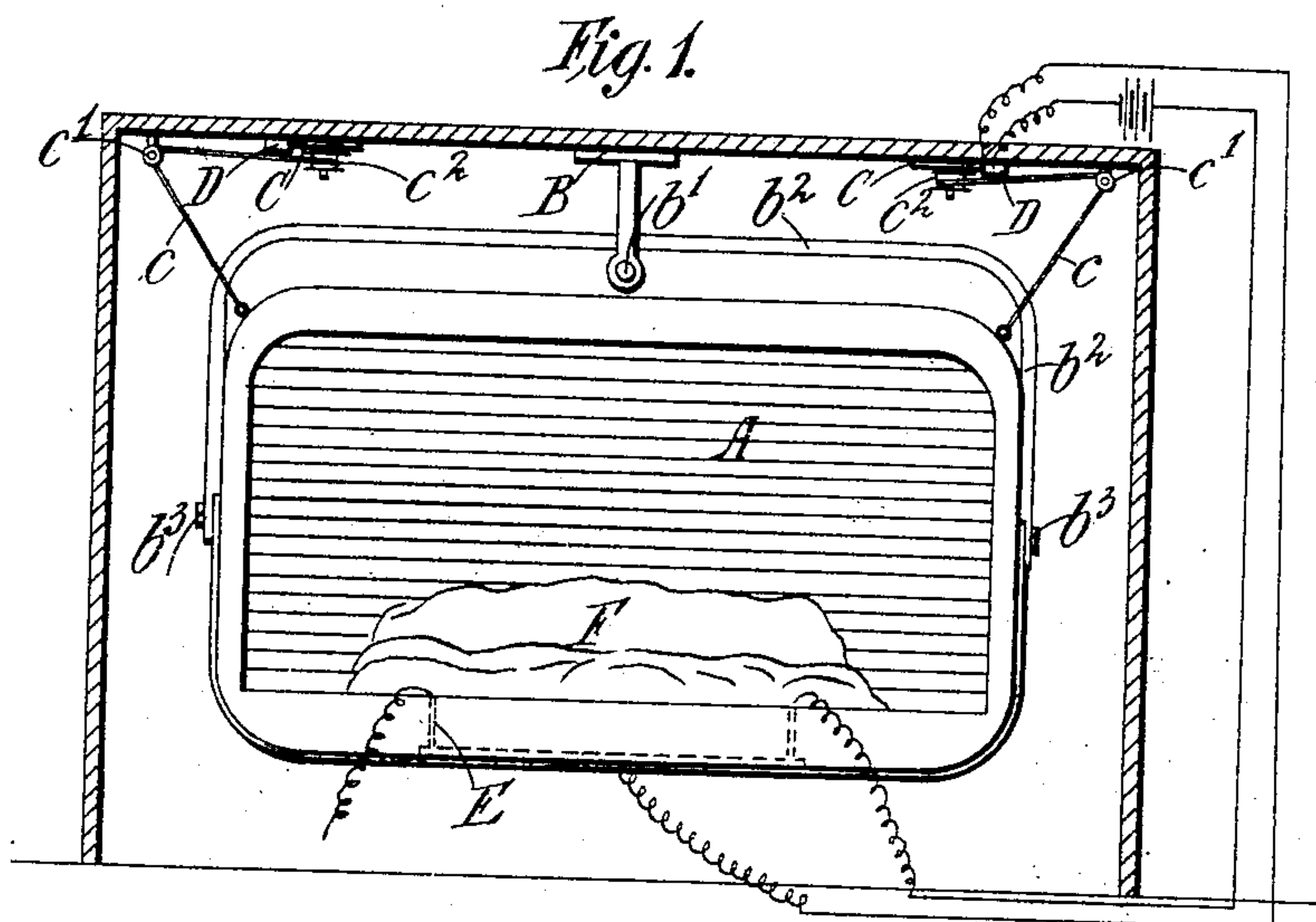
No. 803,947.

PATENTED NOV. 7, 1905.

W. WHITEHOUSE.
CONTROLLING APPARATUS FOR SUSPENDED SHIPS' BERTHS
AND ANALOGOUS DEVICES.

APPLICATION FILED AUG. 31, 1904.

4 SHEETS—SHEET 1.



Witnesses,
James L. Norris, Jr.
Robert Everett,

Inventor,
Walter Whitehouse,
By James L. Norris,
Atty.

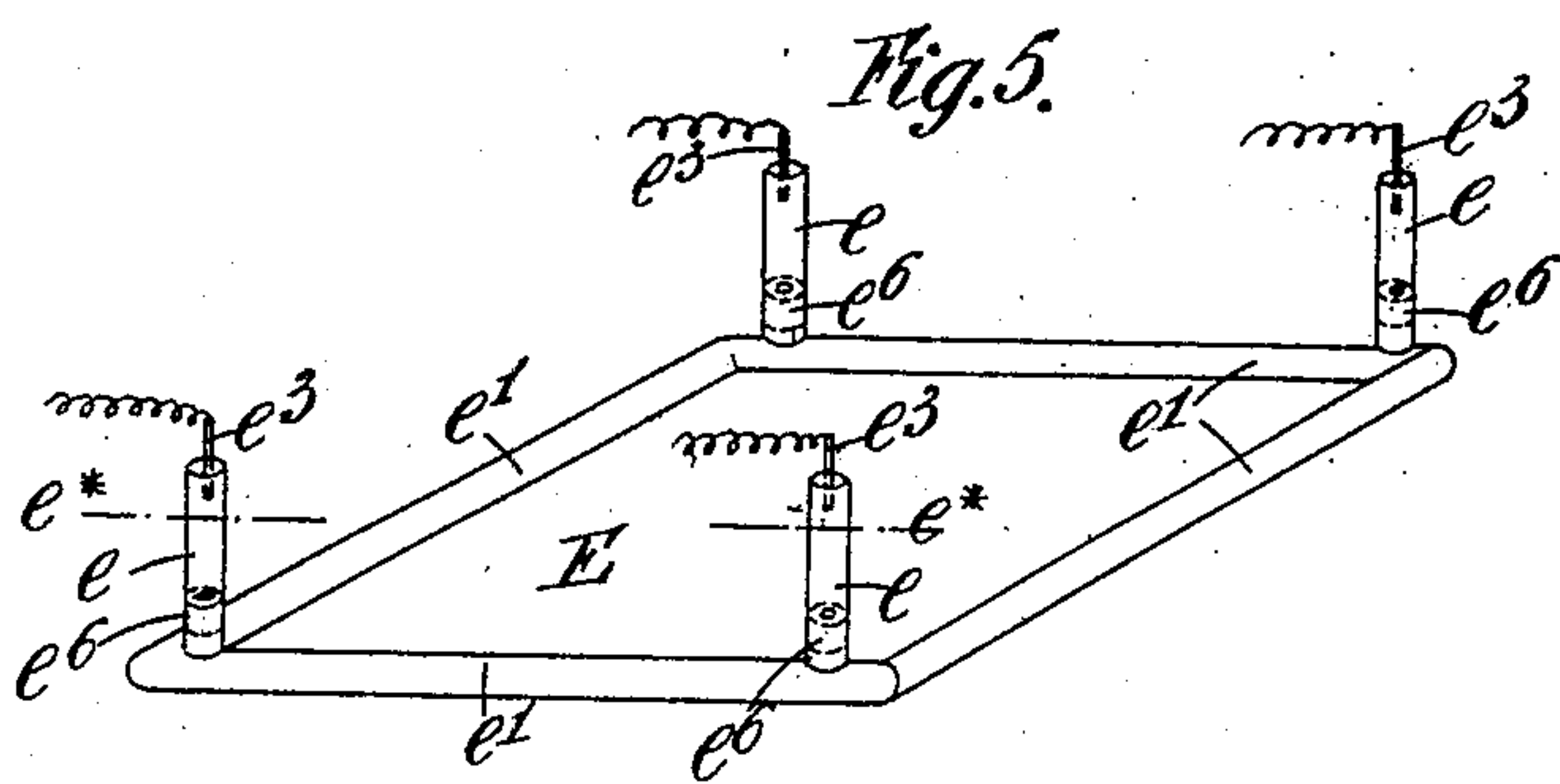
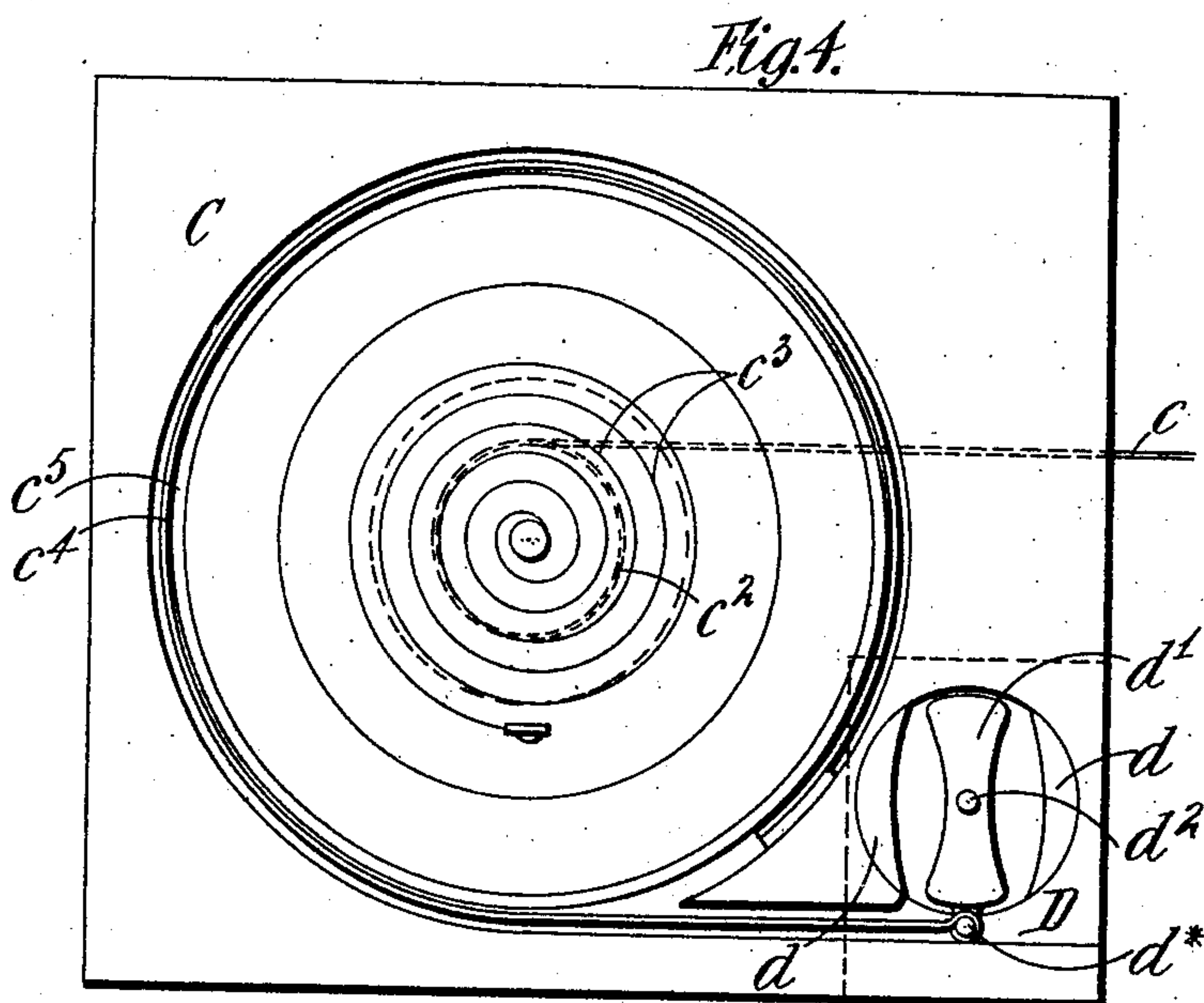
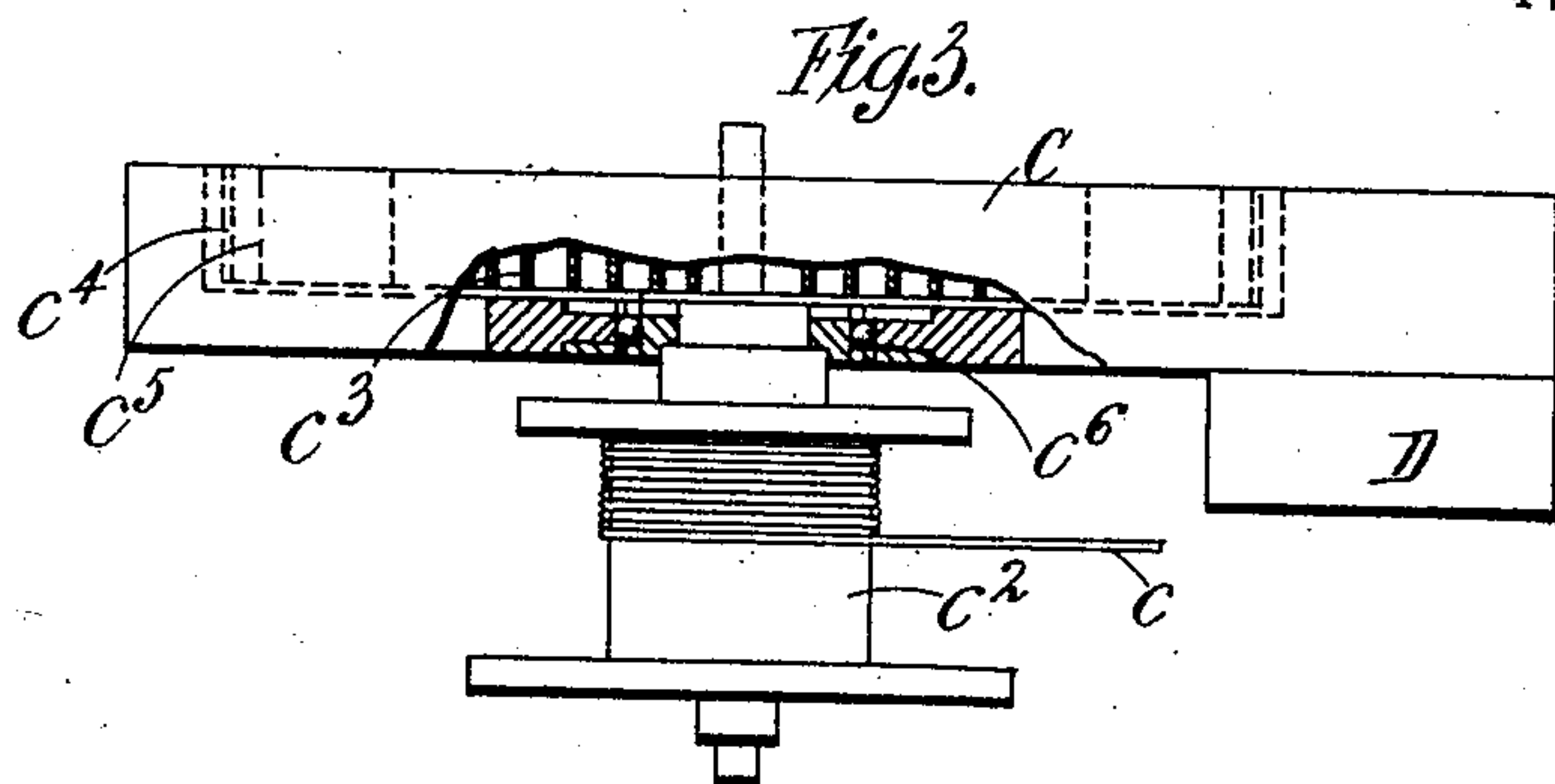
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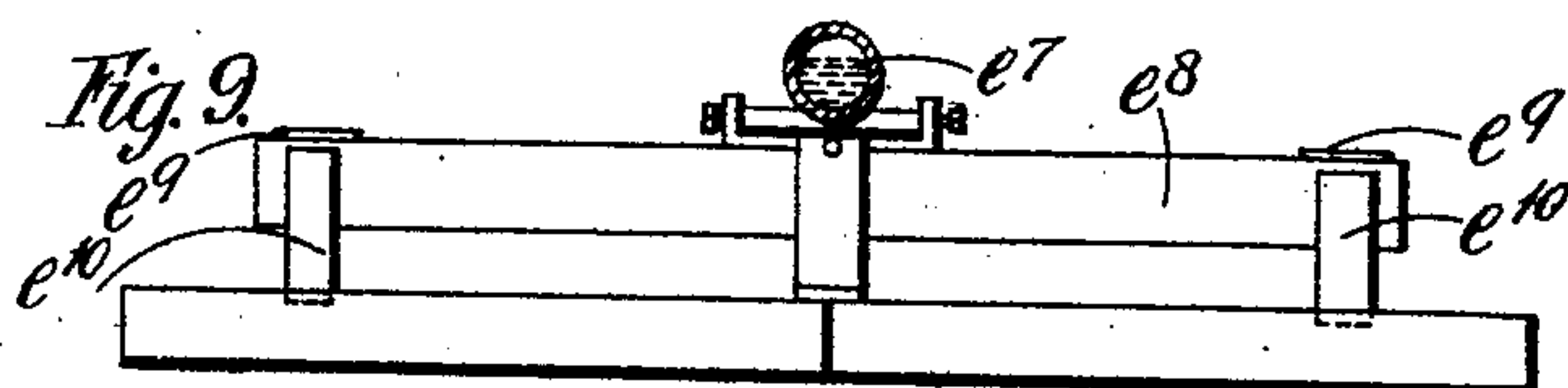
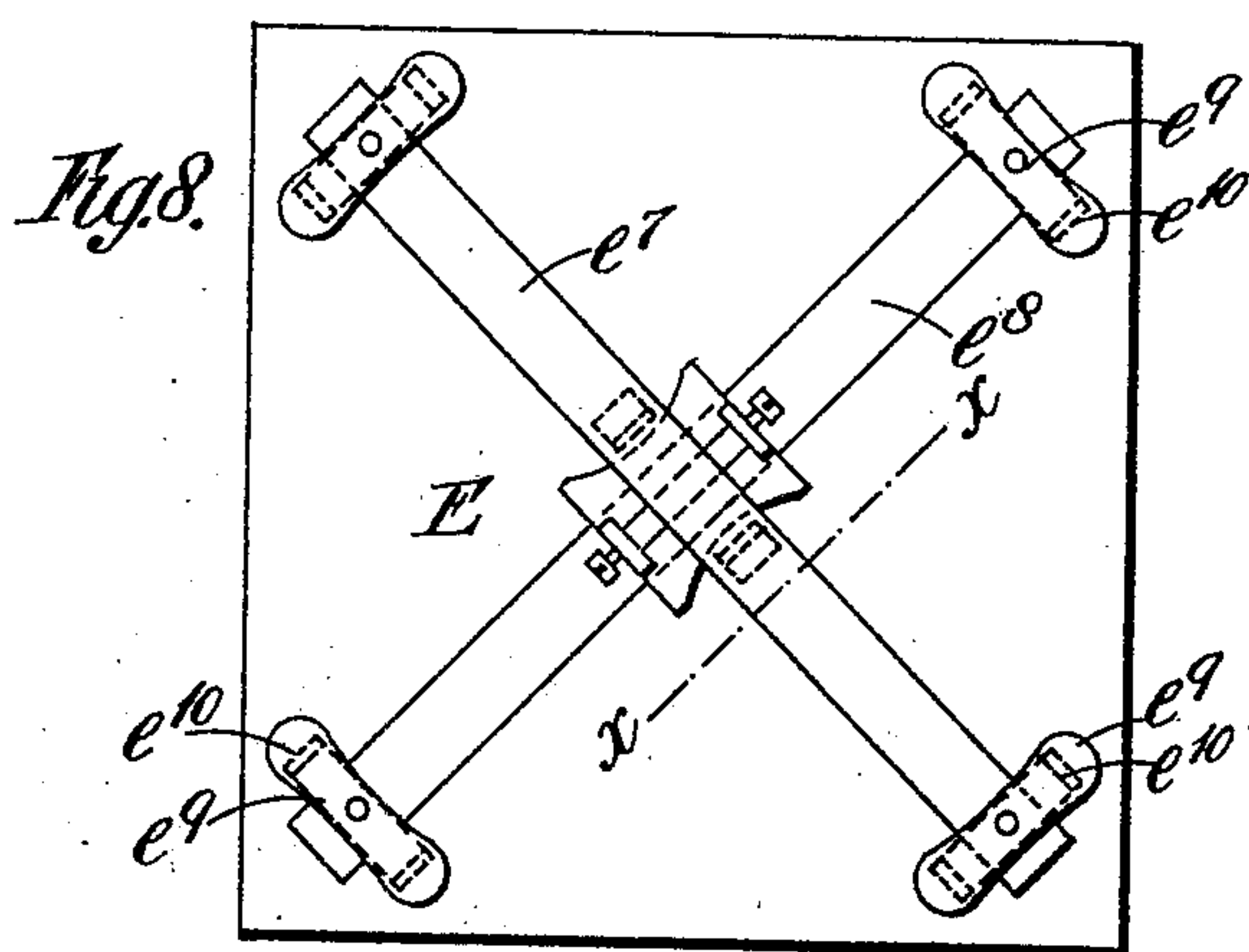
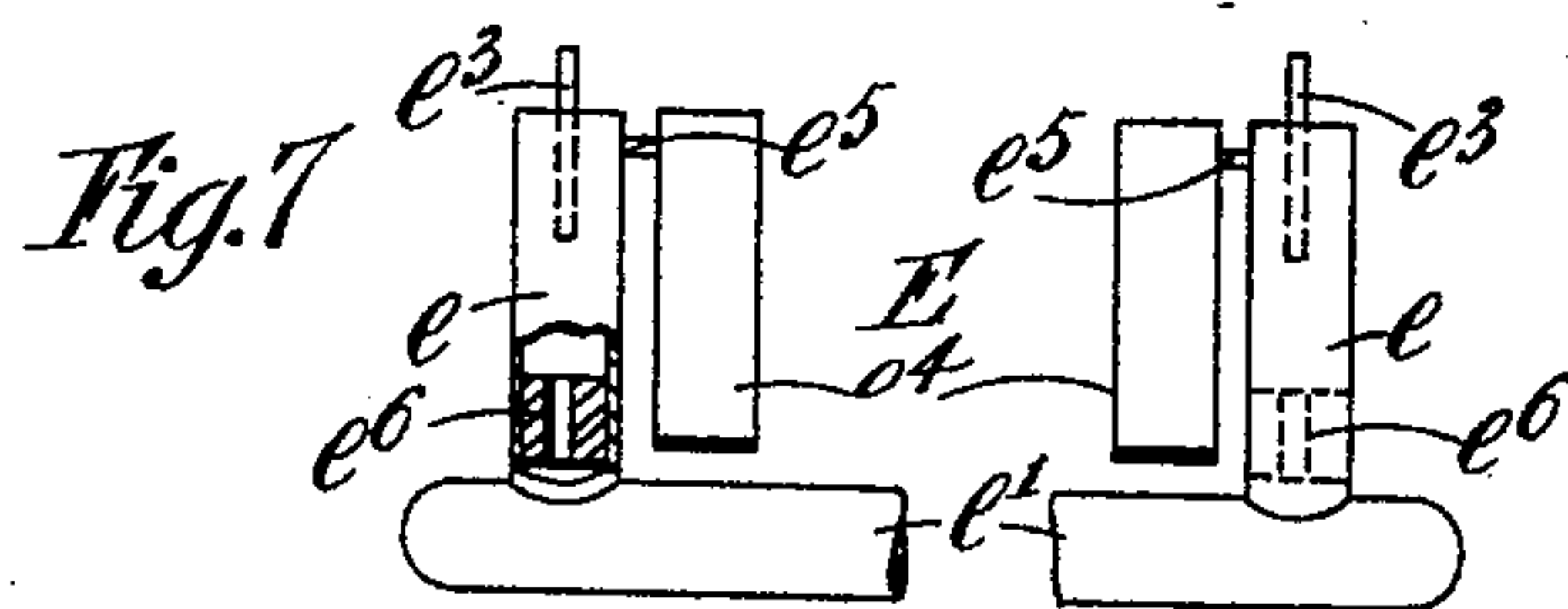
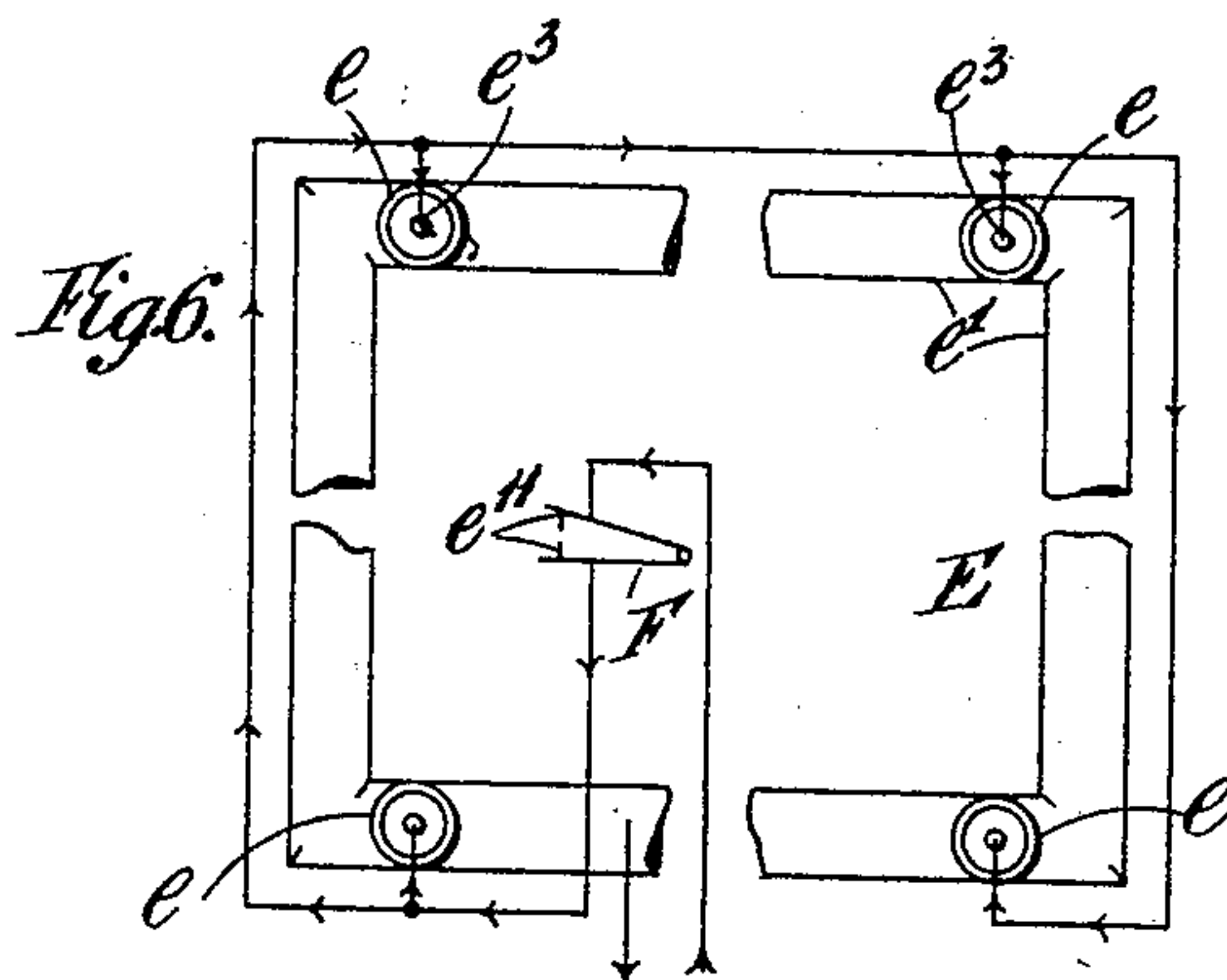
Witnesses,
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4 SHEETS—SHEET 3.



Witnesses,
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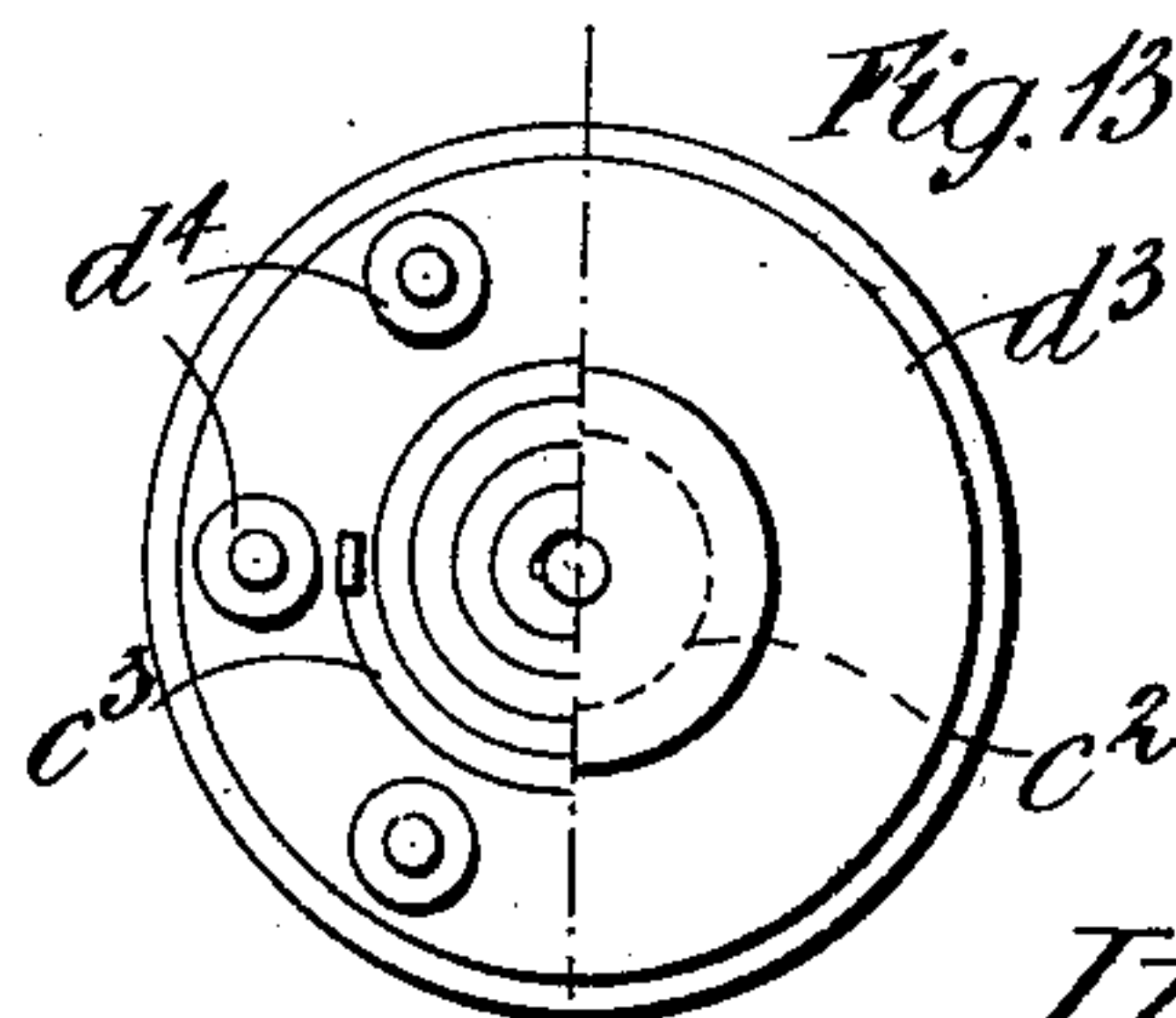
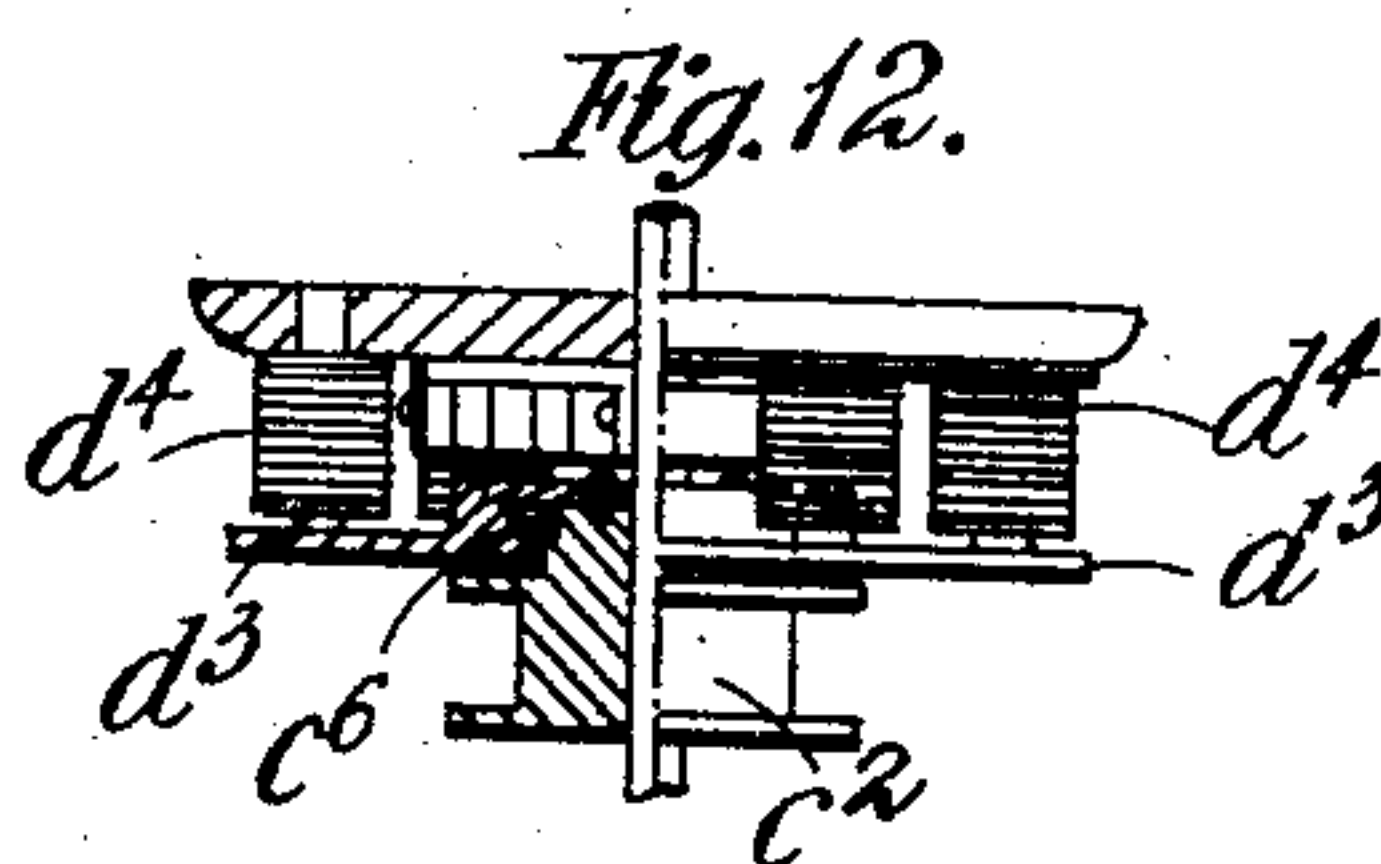
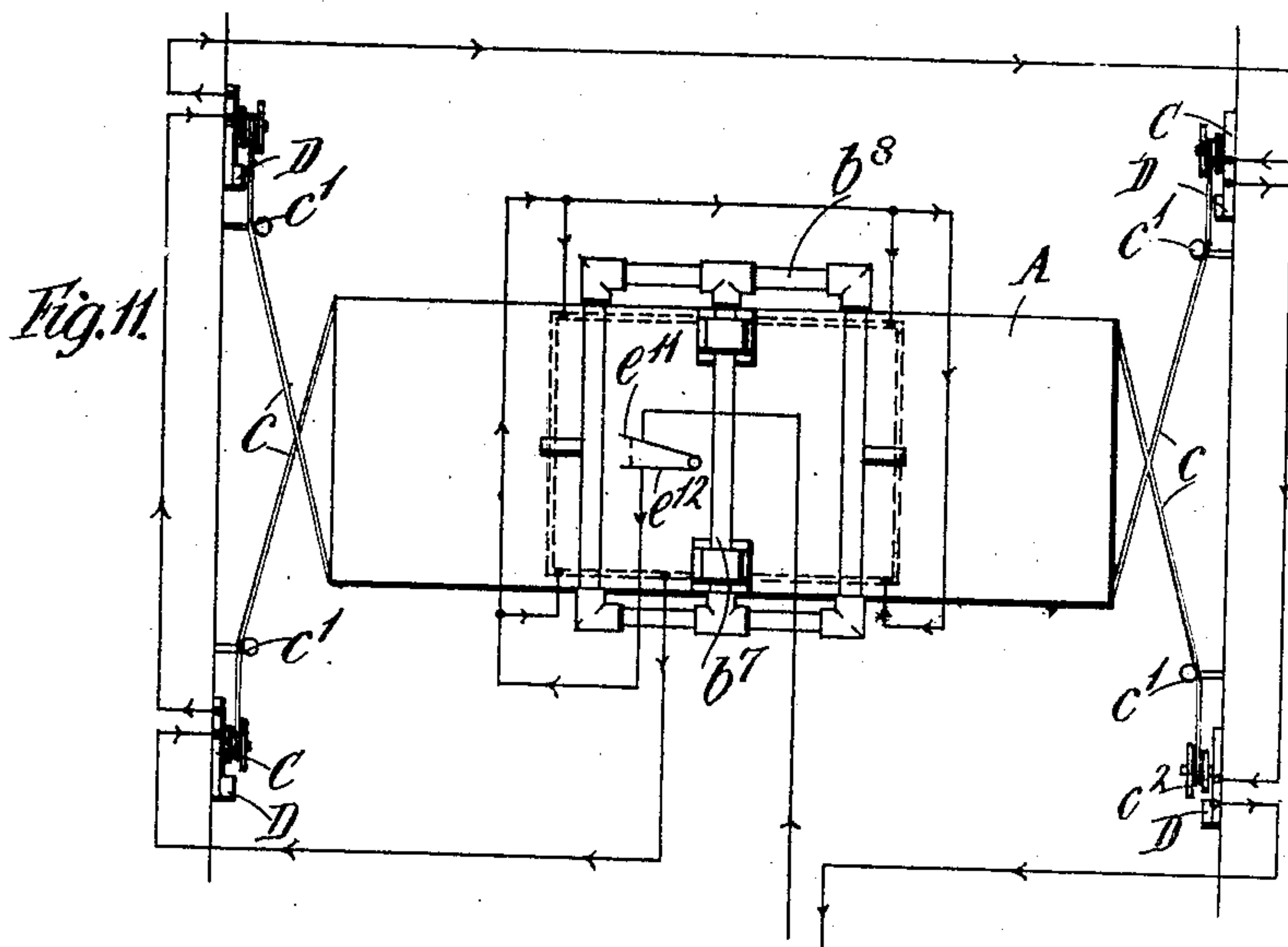
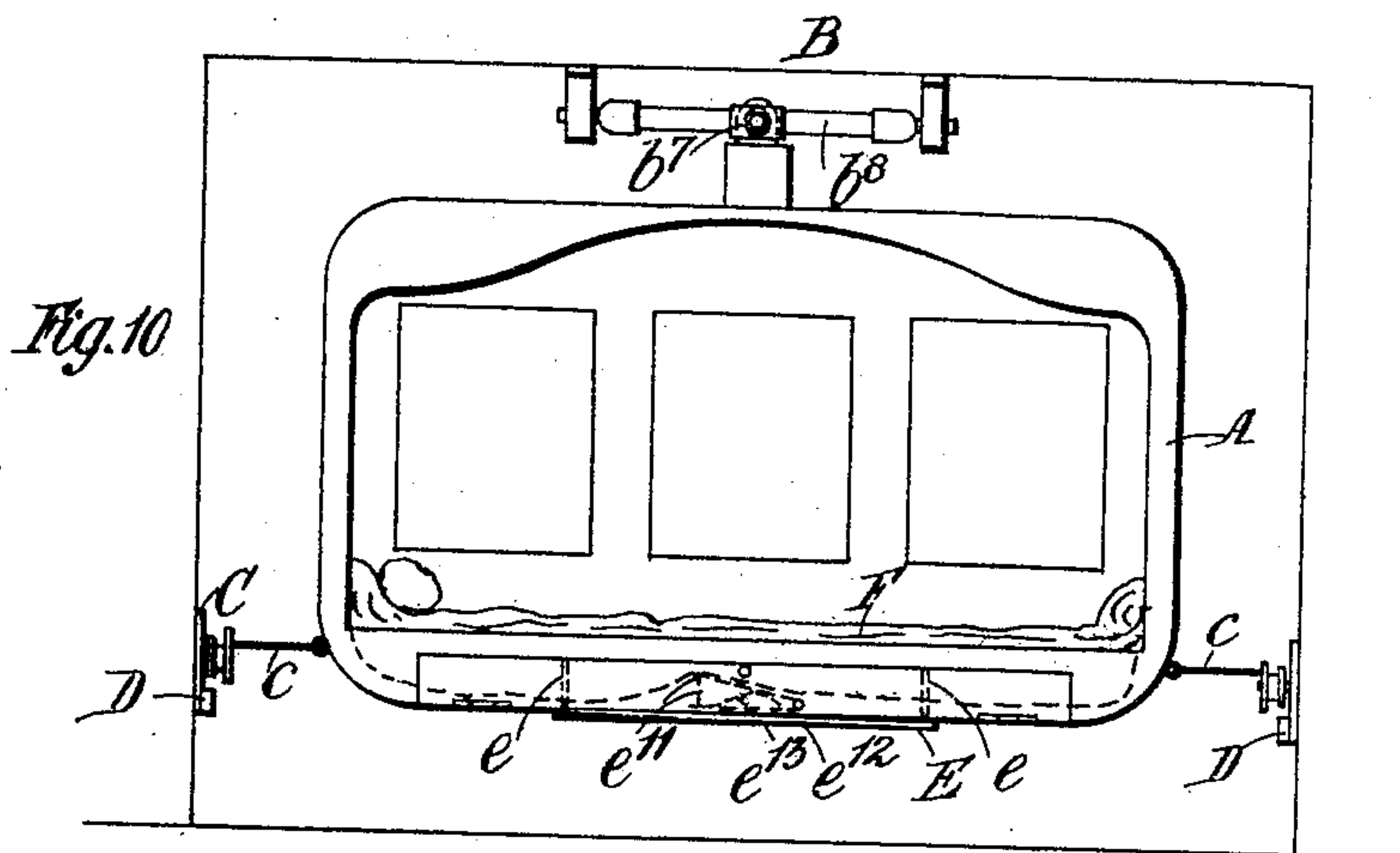
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4 SHEETS—SHEET 4.



Witnesses
James L. Norris, Jr.
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UNITED STATES PATENT OFFICE.

WALTER WHITEHOUSE, OF LONDON, ENGLAND.

CONTROLLING APPARATUS FOR SUSPENDED SHIPS' BERTHS AND ANALOGOUS DEVICES.

No. 803,947.

Specification of Letters Patent.

Patented Nov. 7, 1905.

Application filed August 31, 1904. Serial No. 222,897.

To all whom it may concern:

Be it known that I, WALTER WHITEHOUSE, a subject of the King of Great Britain and Ireland, and a resident of London, in the county of Middlesex, England, have invented certain new and useful Improvements in Controlling Apparatus for Suspended Ships' Berths and Analogous Devices, of which the following is a specification.

10 This invention relates to means or appliances for controlling suspended ships' berths or bunks, platforms, search-lights, and other similar structures or objects the horizontality of which it is desired to preserve.

15 Many attempts have at various times been made to provide suspended ships' berths or bunks with controlling mechanism to prevent the discomforts attendant on sea voyages, but hitherto without success. This has been
20 mainly due to the rolling and pitching of a ship not being a constant motion either in the period or the degree of the roll or pitch due to the varying forces of the waves and wind, and hence a suspended berth or bunk with-
25 out a suitable control from time to time receives a motion which causes it to jerk from the horizontal which it has a tendency to preserve by reason of its weight and gravity.

Now the object of my invention is to provide a berth or bunk (hereinafter termed
30 "bunk" only) which shall by maintaining its horizontality at all times obviate such discomforts, and to this end I provide the bunk with controlling devices—as, for instance,
35 brakes for controlling the bunk and devices for operating and controlling the brakes—so constructed and disposed that any movement of the bunk tending to cause it to lose its horizontality is checked by such devices coming
40 into action automatically on the movement of the bunk. Thus while the bunk is horizontal the said various devices by which the control is effected are out of action; but directly it tends to lose its horizontality by
45 imparted motion one or other of the devices corresponding to the direction in which the said bunk tends to move comes into action, preferably through the agency of electricity, and so preserves its horizontality. The ac-
50 tion of the controlling devices is thus intermittent and in this respect differs from instrumentalities of the kinds hereinbefore proposed for the purpose and which, consisting of springs, buffers, pistons, and the like, must
55 necessarily be constant in their action, being forces that are always active.

The aforesaid brakes are provided with cords (or other suitable flexible connections) by means of which the bunk (or other object) is connected with the walls, ceiling, or other
60 appropriate part of the cabin or of the ship. While the bunk (or other object) remains horizontal, the said cords are free to wind and unwind and are not interfered with by the
65 controlling devices.

The electrical contact devices for controlling the brakes may be of the liquid-carrying type or of the tumbler type and either may be so
70 finely adjusted that the amount of displacement from the horizontal permitted before the brakes come into action is imperceptible.

Where electric current is obtainable, as on most ships running a dynamo for electric lighting or other purpose, preference is given
75 to circular electric brakes as being simpler to construct; but where electric power has to be specially provided, as by means of accumulators, it is preferable to employ a band-brake actuated by a solenoid or a field-magnet provided with a revolving armature.
80

In order that my invention may be readily understood, I will now describe it fully with reference to the accompanying drawings, which show it, by way of example, applied
85 to a suspended ship's bunk, and in which—

Figure 1 is a front elevation of such a bunk embodying the features of my invention, and Fig. 2 an end elevation thereof. Fig. 3 is a side view, and Fig. 4 a plan, of one form of
90 brake which I find advantageous to employ. Fig. 5 is a perspective view, partly broken away, showing a form of contact device which I find to answer my purpose. Fig. 6 is a plan thereof. Fig. 7 shows a modified form of
95 contact device. Fig. 8 is a plan, and Fig. 9 an elevation, of a further modified form of contact device. Fig. 10 is a front elevation, and Fig. 11 a plan, of a modified form of
100 bunk and its suspension devices. Fig. 12 is an elevation, partly in section, of a modified form of brake; and Fig. 13 is an inverted plan thereof, partly broken away.

A is the bunk, and B its suspension device. C represents the brakes; D, the brake-operating devices; E, the contact devices, and F a
105 water bed or cushion.

Referring to Figs. 1 and 2, the bunk A is suspended from a gimbal B, which conveniently comprises two members b^1 and b^2 , the latter of which is formed as a yoke extending
110 centrally along and above the bunk and down each end, where it is articulated at b^3 a little

above the center of gravity of the bunk. The other member consists of a cross-rod b' , having a slidable sleeve b^4 , of approximately half the length of the cross-rod, to which the member b^2 is attached. The said sleeve is provided with a groove b^5 , into which a spline or feather b^6 on one-half of the sleeve b^4 is adapted to engage. This arrangement allows the bunk to be drawn out when to be used, and so provides a free space around it, while when not in use it is shifted against the wall of the cabin, so as to provide more space in the cabin. When required for use, the bunk is drawn along the rod b' until the sleeve b^4 clears the feather b^6 . This rod is then partially rotated by means of a handle b^7 , and the feather bearing against the end of the sleeve prevents the latter from working back.

The brakes C (of which there are four, one for each corner of the bunk) are connected with the bunk by means of flexible cords c , passing over pulleys c' . One end of each of said cords is connected to the bunk and the other end is secured to and wound upon a roller c^2 of the corresponding brake, said roller being provided with a spring c^3 , Fig. 3, to keep the cord continually taut. The various cords are free to wind on and off their respective rollers to suit the constantly-altering angle of the cabin with the horizontal bunk due to pitching and rolling. The brakes proper comprise in this instance bands c^4 , each of which acts upon a hub or wheel c^5 , connected with a corresponding roller c^2 by means of what is well known as a free wheel c^6 , (or equivalent mechanism,) which allows the roller c^2 freedom of movement independently of the brake-wheel c^5 in one direction, but not in the other. When not in action, the brake-band c^4 comes out of contact with the wheel c^5 by its own resiliency.

The brake-operating devices D comprise in the example illustrated in Figs. 3 and 4 magnets d , within the field of which rotate armatures d' , mounted on pivots d^2 . Each of the said armatures is connected at d^x with one of the brake-bands c^4 and applies tension thereto when deflected by an electric current passing through the field-magnets d . In the arrangement shown in Figs. 12 and 13 the brake comprises a metallic disk d^3 , adapted to revolve within the field of a number of electromagnets d^4 . Normally the said disk is free to revolve; but when current is passing through the magnets d^4 it is held by their cores. The free-wheel connection and spring used in this example are similar to those employed in connection with the device shown in Figs. 3 and 4, and therefore they are not shown in Figs. 12 and 13. The said brake-operating devices D are controlled by make-and-break contact devices of any appropriate kind, but advantageously by the arrangement shown in Figs. 5 and 6, wherein four vertical tubes e , containing mercury up to the point

e^x , are employed and communicate together by horizontal tubes e' . The upper ends of the tubes are provided with fixed platinum contact-points e^3 , in electrical connection with the respective brake-operating devices D, as shown in Fig. 1. Thus the smallest movement of the bunk, tending to cause it to lose its horizontality, enables an electric circuit to be completed through one or more of the contact-pieces e^3 , (according to the direction in which the bunk tends to move,) and so brings the corresponding brake or brakes into operation and arrests the movement of the bunk.

Where it is found inconvenient to employ vertical tubes of sufficient length to contain the requisite quantity of air to permit them to be closed, the arrangement shown in Fig. 7 may be adopted. In this example in addition to the vertical tubes e subsidiary closed tubes e^4 , filled with air, are employed and connected at e^5 with the tubes e . Owing to the comparatively large volume of air contained in the tubes e and e^4 , when the contact device is tilted the air will be readily compressed by the weight of the mercury to a sufficient extent to permit the flow of said mercury. In both arrangements in order to prevent the too ready flow of the mercury the vertical tubes e are internally constricted near their bottoms, as shown at e^6 .

In place of the above arrangements a tumbler make-and-break contact, such as shown in Figs. 8 and 9, may be employed. This consists of two closed tubes or tumbler-arms e^7 e^8 , arranged cruciform and pivoted at right angles to each other. The said tubes are partially filled with mercury and cooperate with stationary contact-pieces (not shown in the drawings) in the well-known manner. In order, however, to prevent the tubes or arms e^7 e^8 from chattering or "splashing" on and off the stationary contacts, and so failing to make good and steady contact therewith, each of the free ends of the said tubes is provided with a flexible armature e^9 , adapted to cooperate with a fixed permanent magnet e^{10} . This magnet holds its respective tube or tumbler arm until a loss of horizontality in the opposite direction causes said tube or tumbler-arm to break away.

To prevent waste of electric current and to obviate the necessity of switching the same on and off, contacts e^{11} , Fig. 10, are employed and are arranged between hinged plates e^{12} , which are normally held apart by means of a spring e^{13} . These contacts are interposed between the bottom of the bunk and the bed or cushion, the arrangement being such that the weight of the occupant's body depresses the upper plate and completes the electrical circuit or connection. When, however, the occupant quits the bunk, the plates e^{12} spring apart, so breaking the circuit.

To insure against loss of horizontality of the bunk from any variation in the position

of the occupant, I provide a bed or cushion F, partially filled with water, (or other liquid having approximately the same specific gravity as the human body,) so that the weight of the occupant by pressing the water toward one end or one side of the bed, as the case may be, will automatically compensate for any variation in position, and so maintain the constancy of the center of gravity by the displacement of the water. The ends of the bed are disposed at a slight incline and are empty when not in use, but receive an amount of water varying in proportion to the weight of the occupant.

I do not confine myself to the precise details of construction and arrangement, either mechanical or electrical, herein described, as it is obvious they may be modified to suit circumstances. For instance, in lieu of the form of gimbal illustrated in Figs. 1 and 2 a gimbal of any ordinary construction, such as that shown in Figs. 10 and 11, may be employed. In this arrangement the bunk A is suspended from a rocking shaft b^7 , which is itself mounted in a frame b^8 , adapted to rock about an axis arranged at right angles to that of the rocking shaft. Again, instead of the platinum pieces e^3 , Figs. 5 to 7, being adapted to make direct contact with the mercury I may employ floats and so arrange them as to carry the movable members of the contacts. Furthermore, instead of the hinged plates e^{12} for making the contact when the occupant enters the bunk I may employ a flexible connection, (such as a metallic cord) attached to one side of the bunk and extending across the bunk to a spring which keeps it taut and the electric circuit broken, but which circuit is completed by the weight of the occupant depressing the flexible connection.

The means hereinbefore described may with suitable modifications be equally well applied to platforms, searchlights, deck-chairs, or other similar structures or objects where it is desired to preserve their horizontality.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a suspended object and the means for suspending same, of a controlling or motion-restraining device, means for permanently connecting said object with said motion-restraining device, and means for automatically bringing said motion-restraining device into action under predetermined conditions.

2. The combination with a suspended object and the means for suspending same, of a normally inoperative motion-restraining device, means for permanently connecting said object with said motion-restraining device, and means governed by the position of the suspended object relatively to the horizontal, for setting said motion-restraining device in

operation whenever the suspended object departs from the horizontal.

3. The combination with a suspended object, and means for suspending the same freely from a part of a ship, of means, independent of the suspension devices, for connecting said object with a fixed point relatively to the ship, of an electrically-operated brake interposed between said fixed point and the object, of means for normally rendering the brake inoperative as regards freedom of relative motion between the so-called fixed point and the suspended object, and of gravity-controlled means for establishing operative relations between the brake and the suspended object whenever said object departs from the horizontal.

4. The combination with a ship's bunk and gravity-controlled means for suspending the same, of a brake connected to a fixed point on the ship, a cord connected to said brake, means for normally permitting freedom of relative movement between the so-called fixed point and the bunk irrespective of the brake, and means inoperative while horizontal, for operating the brake whenever the bunk departs from the horizontal.

5. The combination with a ship's bunk and gravity-controlled means for suspending same, of a controlling or motion-restraining device, flexible means connecting said bunk, through the intervention of the motion-restraining device, with a fixed point relatively to the ship, and means for automatically setting said motion-restraining device in operation whenever the bunk departs from the horizontal.

6. The combination with a ship's bunk and means for suspending the same freely under gravity, of a normally inoperative brake, means for permanently connecting said bunk with said brake, means for electrically operating the brake, and gravity-controlled contacts for completing the brake-operating circuits whenever the bunk departs from the horizontal.

7. The combination with a ship's bunk and means for suspending the same freely under gravity, of a normally inoperative brake, means for electrically operating the same, tumbler-contacts for completing the brake-operating circuits whenever the bunk departs from the horizontal, and means, such as magnets, for lightly holding the tumblers to prevent them from chattering or "splashing" on and off.

8. A normally inoperative brake having means for permanently connecting it with a suspended object and with a fixed point, and a gravity-controlled actuating device for automatically setting said brake in operation under predetermined conditions.

9. The combination with a suspended object, of a brake, means for connecting the

same with a fixed point, means for permanently connecting said object with said brake, means for normally permitting freedom of relative movement between said suspended
 5 object and the fixed point, and means, sensitive to changes of level, for automatically establishing operative relations between the brake and the suspended object whenever the latter departs from the level or horizontal.

10 10. The combination of a ship's bunk or berth, means for suspending the same under the influence of gravity, an automatic brake mechanism normally inoperative for controlling the movement of the bunk and a water
 15 bed or cushion in said bunk or berth, said bed or cushion having upwardly-inclined ends forming empty spaces into which the water can flow when displaced by the weight of the occupant.

20 11. The combination of a ship's bunk or berth, means for supporting same so that it retains its proper position by gravity independently of the angle of the cabin, automatic brake mechanism coöperative with the
 25 bunk and normally inoperative, and a water bed or cushion which can be rendered susceptible to changes of position of the occupant, so as to compensate for such changes, by said bed or cushion having upwardly-inclined ends
 30 forming empty spaces into which the water can flow when displaced by the weight of the occupant.

12. The combination of a ship's bunk or berth, means for suspending same under the
 35 influence of gravity, brakes for preventing the bunk or berth from acquiring a swinging or swaying motion, flexible means for permanently connecting said brakes with said bunk or berth and a water bed or cushion carried
 40 by said bunk or berth.

13. The combination of a ship's bunk, means for suspending same, a normally inoperative brake, means for connecting the brake with a

fixed part of the cabin or ship, flexible means for permanently connecting the brake with
 45 the bunk, and means operated by a movement of the bunk for actuating the brake.

14. The combination with a ship's bunk or berth, of means for suspending same under the
 influence of gravity, a brake, means for con-
 50 necting said brake with the bunk or berth and with a fixed part of the cabin, means for electrically operating said brake, and a contact device, operated by the weight of the occupant, for closing the electric brake-circuit. 55

15. The combination with a ship's bunk or berth, of means for suspending same under the
 influence of gravity, an electrically-operated brake for controlling said bunk or berth, a
 60 water-bed and a contact device located between the bottom of the bunk or berth and the water-bed for controlling the electric brake-circuit.

16. The combination with a ship's bunk and means for suspending the same under the in-
 fluence of gravity, of a brake, means for con-
 65 necting said brake in a normally inoperative manner with the bunk and with a fixed part of the cabin, devices for electrically operating said brake when the bunk departs
 70 from the horizontal, gravity-controlled contacts for controlling said brake-operating devices, a water-bed, and a contact interposed between said water-bed and the bottom of the
 75 bunk for interrupting the electrical circuit of said operating devices when the bunk is vacant, but closing said circuit by the weight of the occupant at other times.

In witness whereof I have hereunto signed
 my name in the presence of two subscribing
 80 witnesses.

WALTER WHITEHOUSE.

Witnesses:

GEORGE ERNEST MINTERN,
 FREDK. L. RAND.