

No. 692,871.

Patented Feb. 11, 1902.

H. LEMP.

MOTION CHECKING DEVICE.

(Application filed July 18, 1900. Renewed Nov. 1, 1901.)

(No Model.)

2 Sheets—Sheet 1.

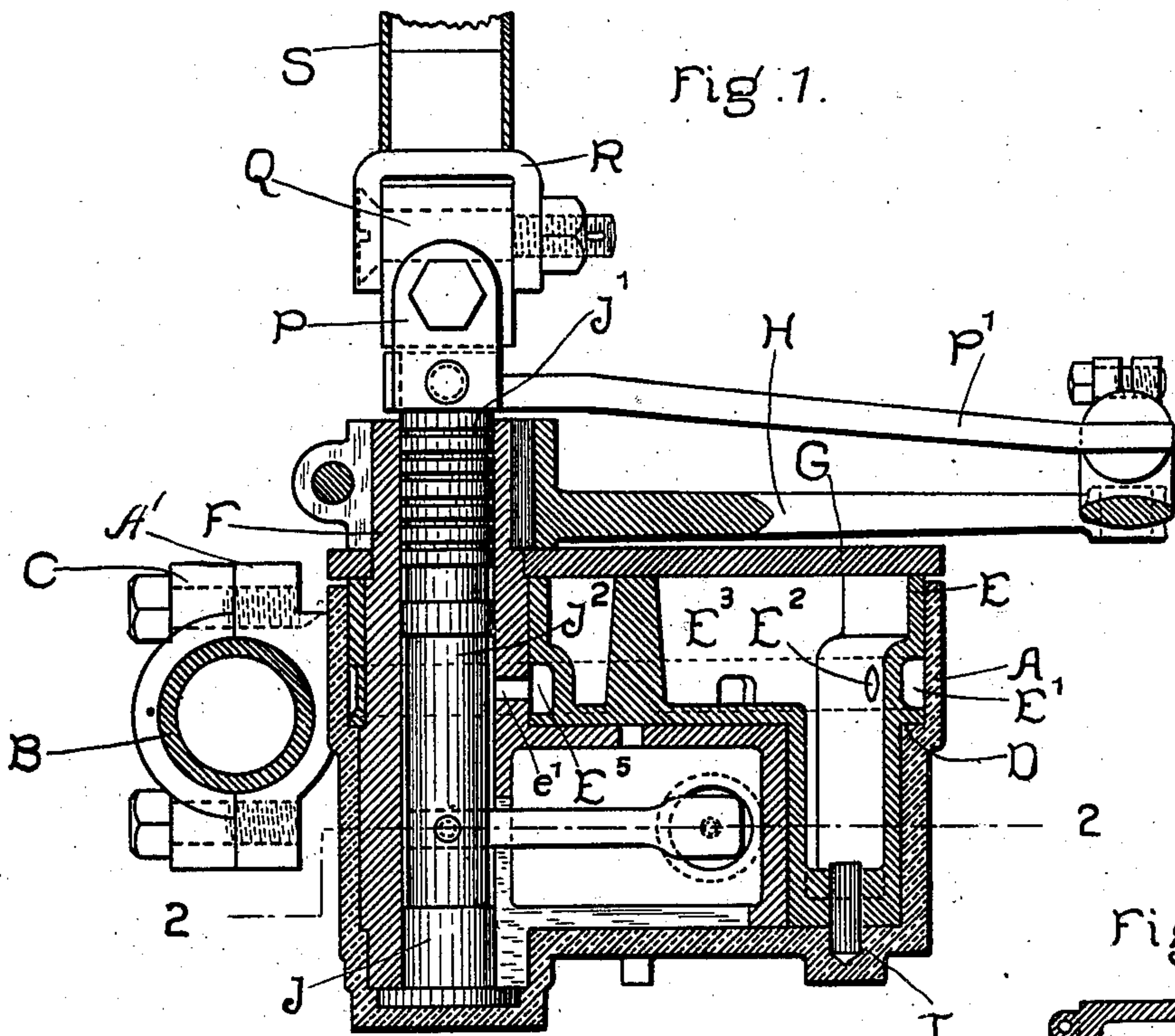


Fig. 4.

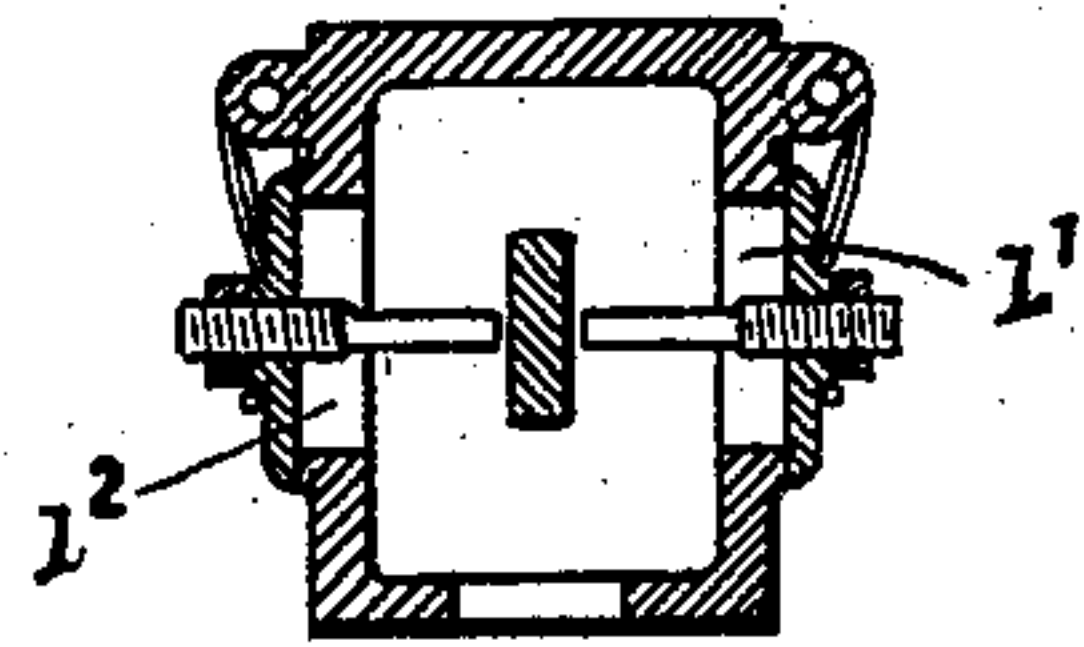


Fig. 2.

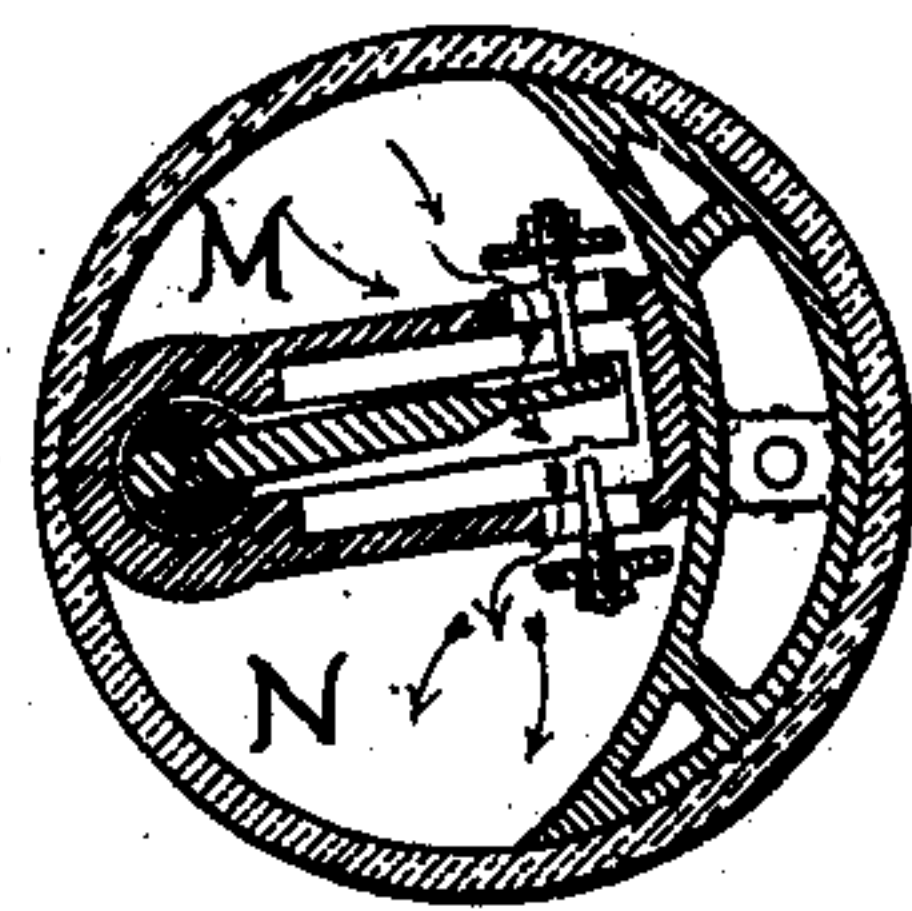
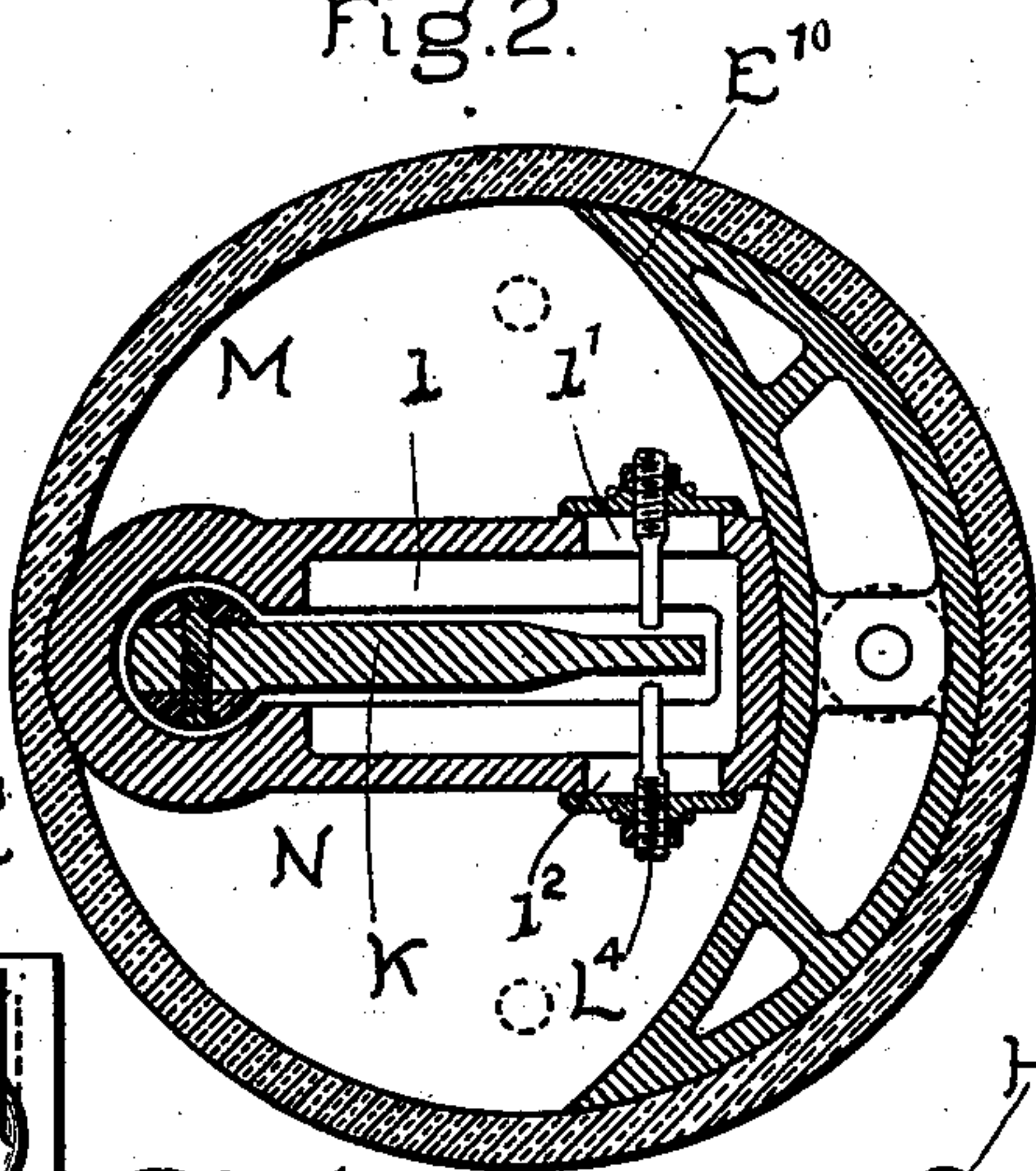
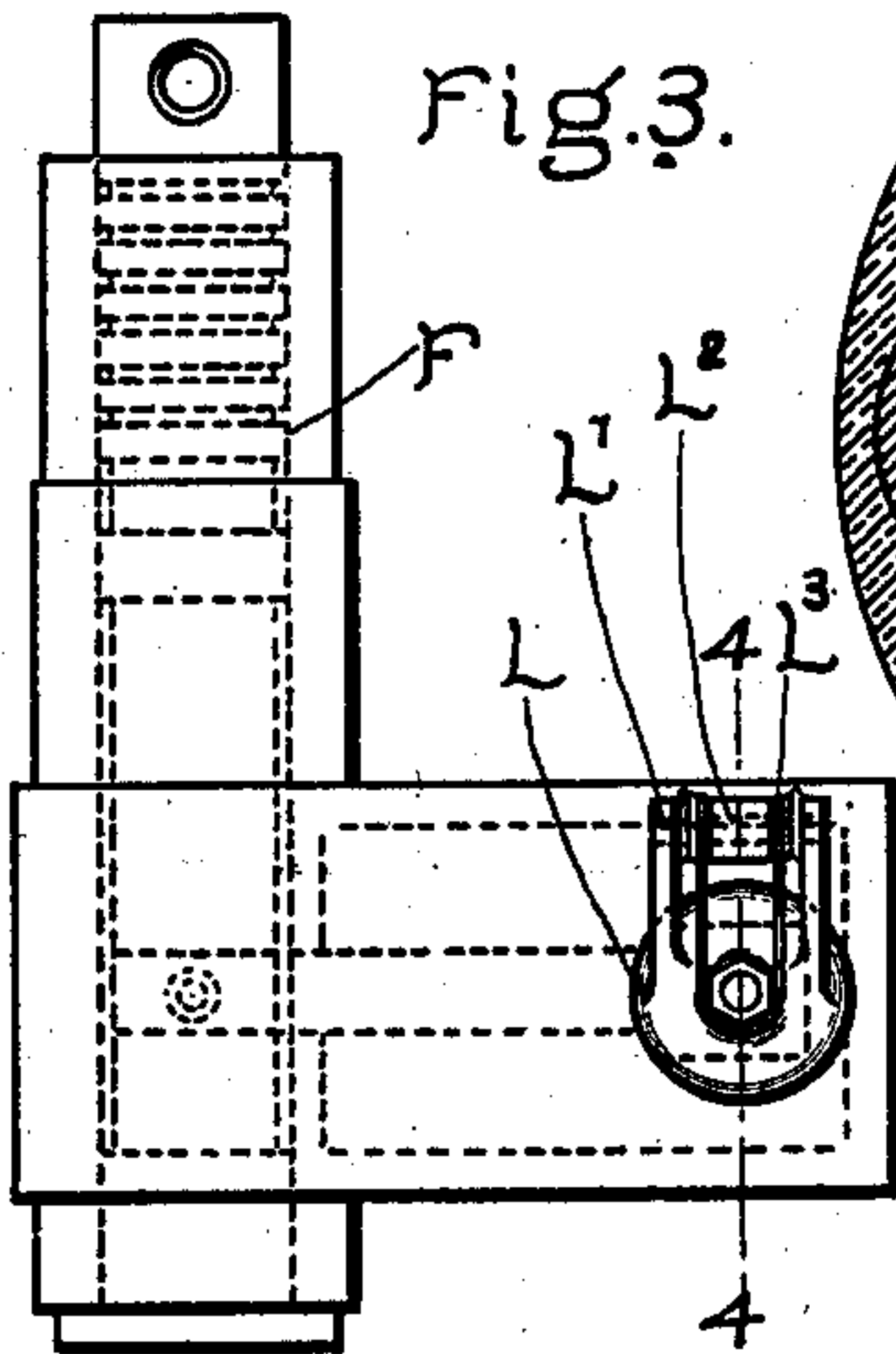
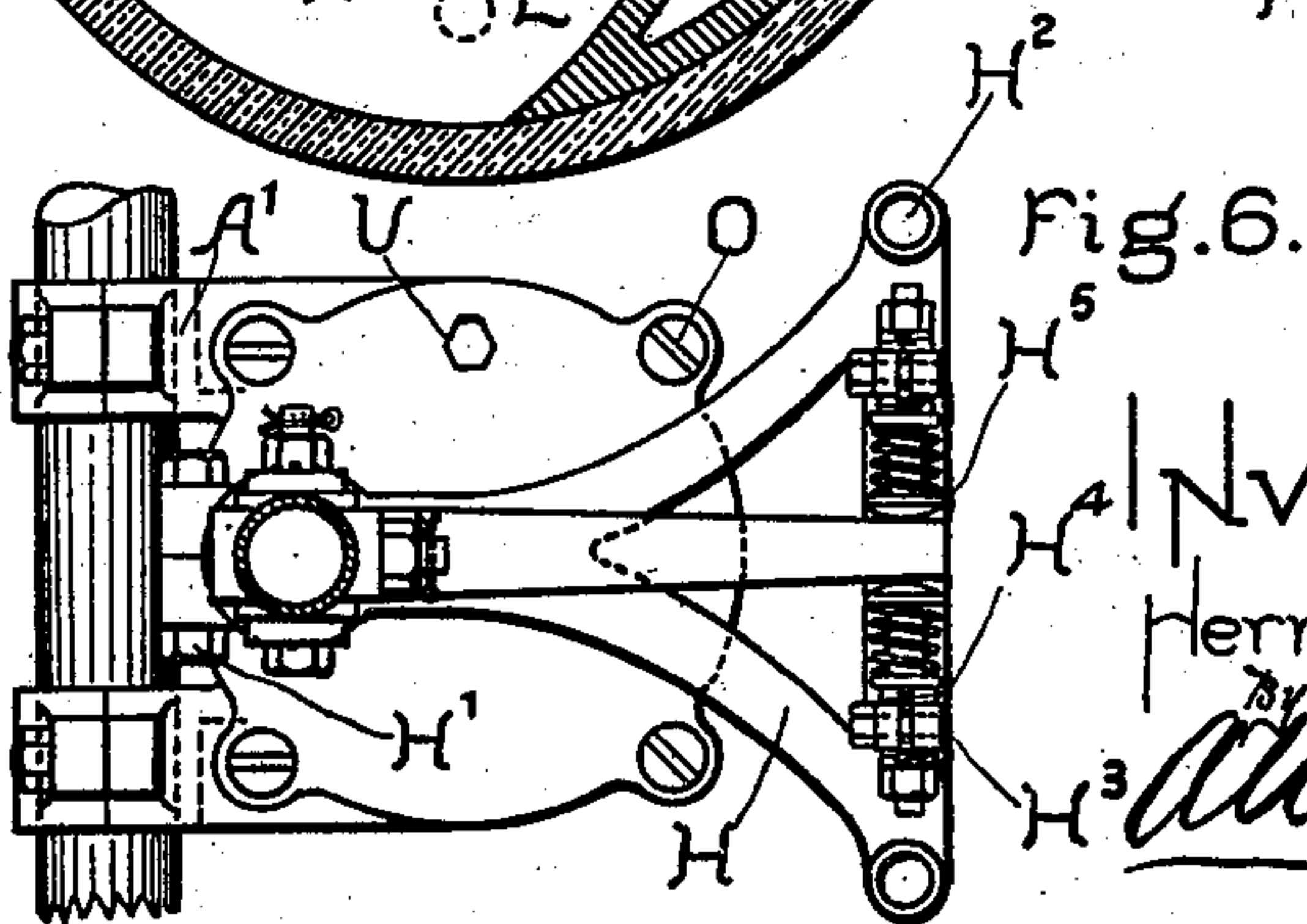


Fig. 5.



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2 Sheets—Sheet 2.

Fig. 7.

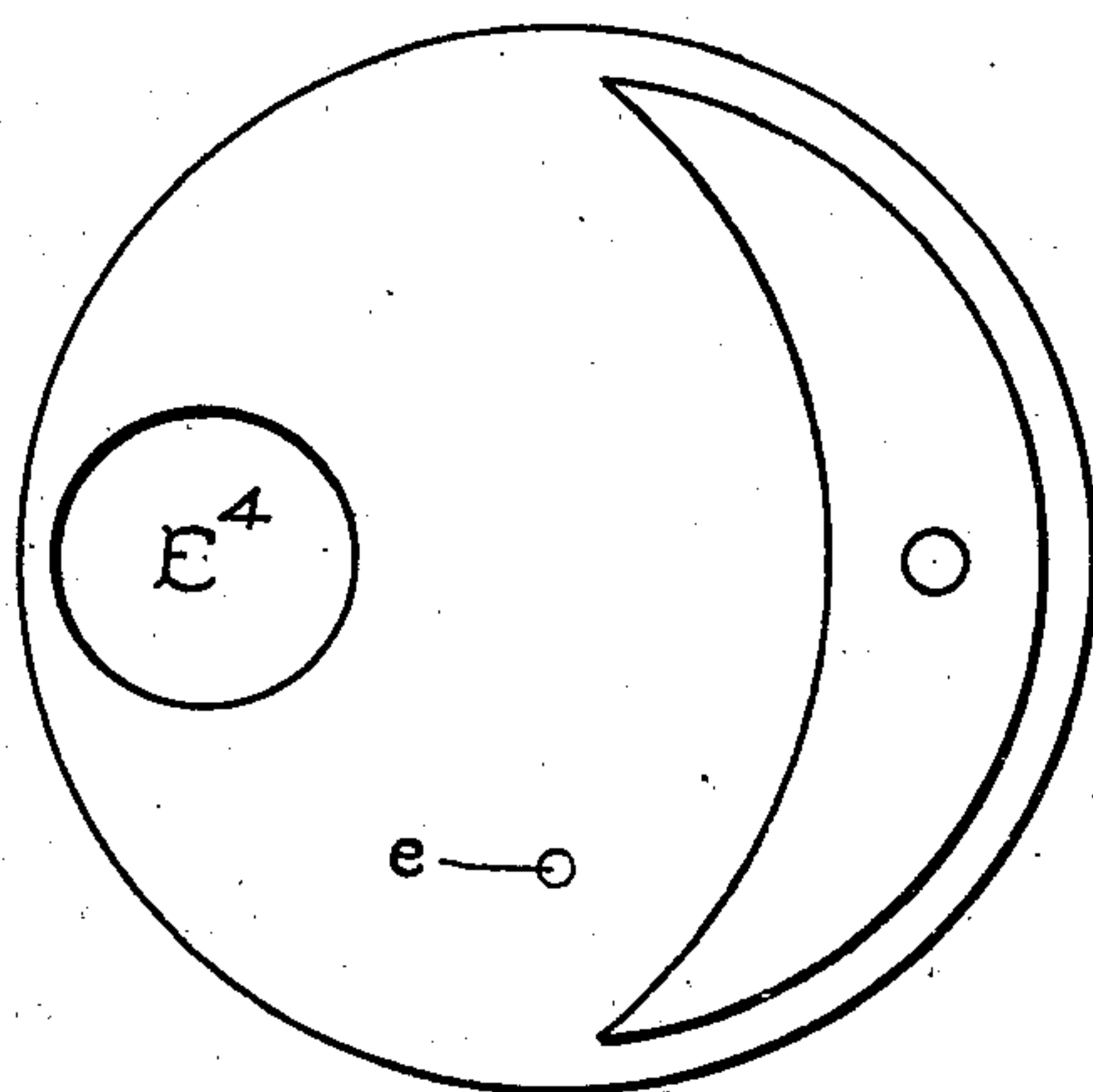


Fig. 8.

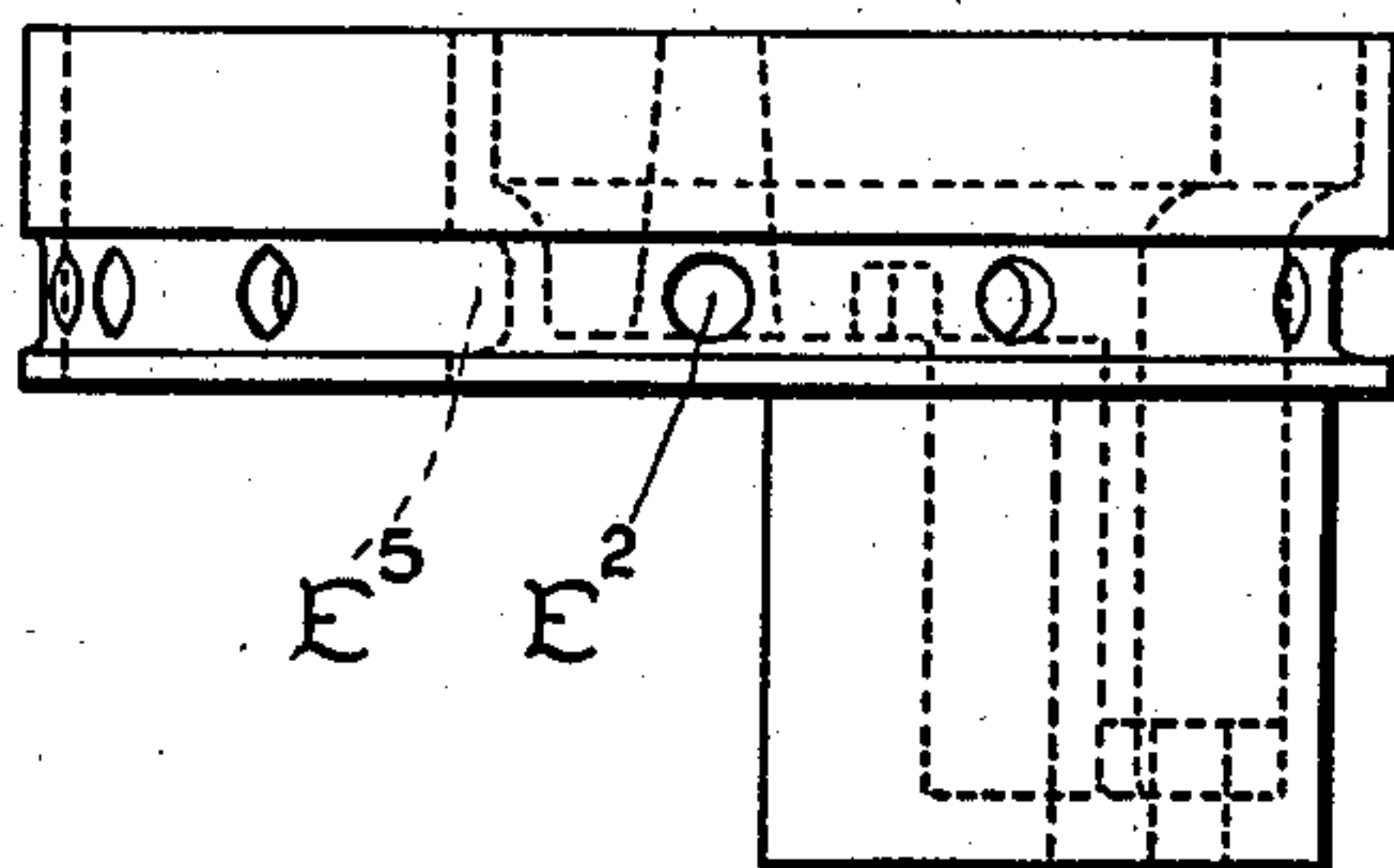
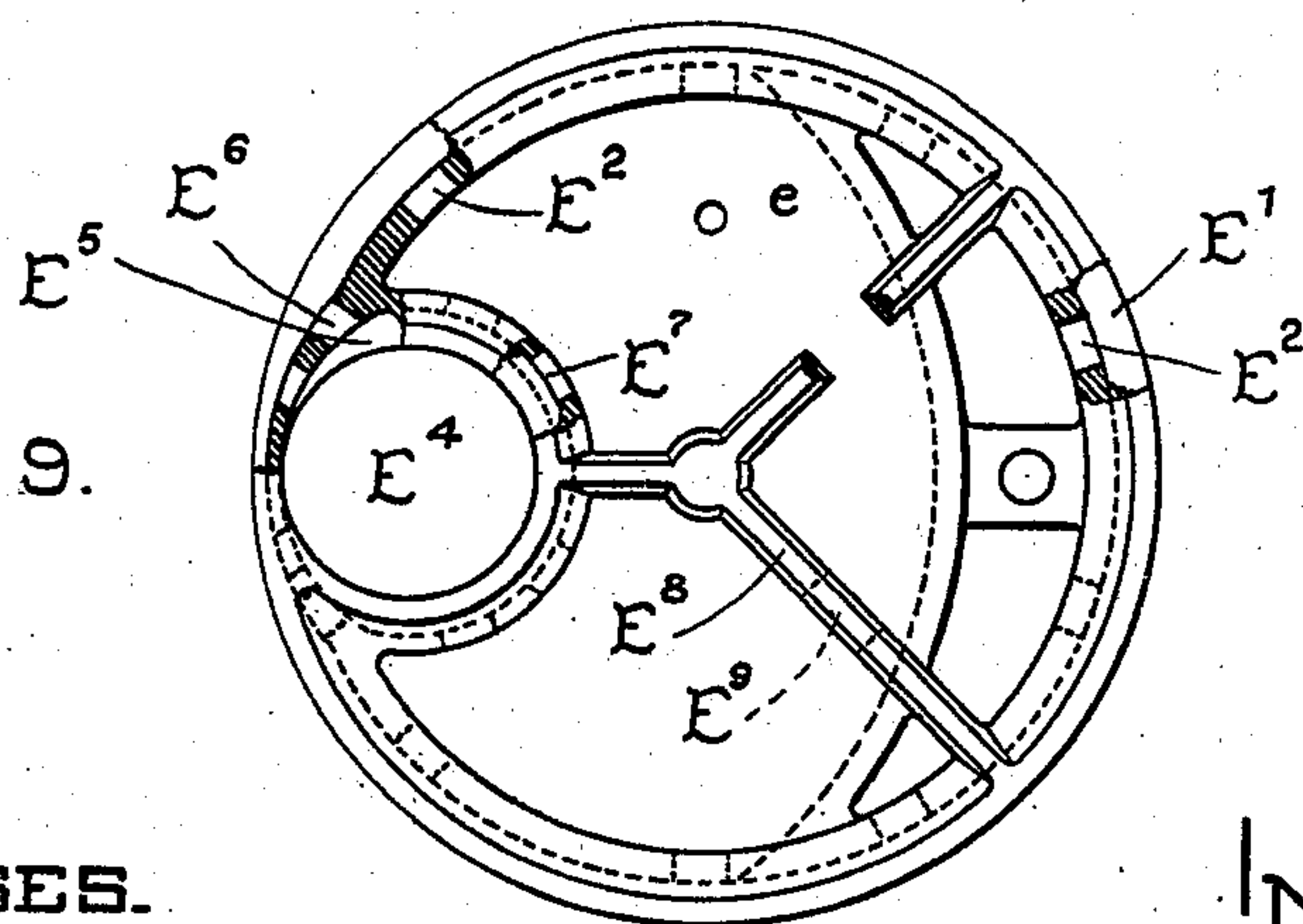


Fig. 9.



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UNITED STATES PATENT OFFICE.

HERMANN LEMP, OF LYNN, MASSACHUSETTS, ASSIGNOR TO ELIHU THOMSON, OF SWAMPSCOTT, MASSACHUSETTS.

MOTION-CHECKING DEVICE.

SPECIFICATION forming part of Letters Patent No. 692,871, dated February 11, 1902.

Application filed July 18, 1900. Renewed November 1, 1901. Serial No. 80,823. (No model.)

To all whom it may concern:

Be it known that I, HERMANN LEMP, a citizen of the United States, residing at Lynn, in the county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Motion-Checking Devices, (Case No. 1,369,) of which the following is a specification.

In my pending application, Serial No. 686,063, filed on or about July 15, 1898, I have described and claimed a motion-checking device, more particularly described in connection with vehicles, which is so arranged that the wheels are automatically locked against road strains and one which is so constructed that a movement of the handle in the direction required to steer the vehicle first releases the locking mechanism and then causes the steering of the vehicle.

The present application has for its object to improve the construction of the apparatus of the type above referred to.

In the accompanying drawings, which illustrate an embodiment of my invention, Figure 1 is a vertical section of the checking device. Fig. 2 is a horizontal section taken on the line 2 2 of Fig. 1. Fig. 3 is a view showing the piston in elevation. Fig. 4 is a section taken on the line 4 4 of Fig. 3. Fig. 5 is a sectional view showing the relation of the parts during the act of moving. Fig. 6 is a plan view of the check on a reduced scale. Fig. 7 is a bottom plan view of the removable member, which contains an auxiliary chamber. Fig. 8 is a side elevation thereof, and Fig. 9 is a top plan view of the same.

In my prior application the center of motion of the steering-handle coincides with the center of the main chamber containing the piston and fluid. The construction of the present apparatus differs principally in that the centers of motion of the steering-handle and that of the piston are eccentric with respect to the center of the main cylinder. By this arrangement of parts I am enabled to greatly reduce the size of the cylinder without in any way decreasing the effective operation of the check and also to reduce the cost of manufacture. The other features of difference will be more fully described and claimed hereinafter.

In the drawings, A represents a cylinder

or casing, which is provided with lugs A', that form a portion of the clamp for securing it to the tubular stationary axle B. The balance of the support is formed by detachable caps C, which are held in place by bolts. The interior of the casing is preferably cylindrical on account of the ease with which it can be made. About midway between the top and bottom of the casing is formed a shoulder D, on which rests the removable member E.

The piston for the check is substantially L-shaped, as shown in Fig. 3, and is provided with a hub or extension F, which passes through the removable member E, top plate or cover G, and actuator H. The lower end of the hub is extended and fits into a bearing in the bottom of the cylinder. A portion of the piston is extended to the right and is provided with a chamber I, having valve openings or ports I' and I². The piston is arranged to make a working fit with the base of the casing A and with the surface E¹⁰ of the casting or member E, the said surface being concentric with the center of motion of the piston. In addition to this the piston also makes a working fit with the under side or surface of the casting. Passing downward through the hub of the piston is a shaft J, upon which are turned near the upper end a series of small grooves J'. These grooves are intended to prevent the free entrance of air. Below these narrow grooves are two portions of the shaft having reduced cross-sections, as J², for example. These reduced portions are filled with fluid, which is received through the opening e', which fluid acts to prevent the entrance of air. The lower end of the shaft is slotted, and mounted therein and extending outward into the chamber I is a valve-actuator K. On each side of the piston is located a flap-valve L. These valves are provided with two upwardly-extending arms L' and are secured in place by a pin which extends through the boss L², formed on the side of the piston. Coiled around each of these supporting-pins is a spring L³, which is so arranged that it normally tends to hold the valve in its closed position. Mounted in the center of each valve L is an adjustable pin L⁴, which is arranged to engage with the valve-actuator K and be moved thereby when

it is desired to steer the vehicle. Located above the piston and also on the right-hand side thereof is a removable member composed of a casting E, which forms an auxiliary chamber for receiving fluid—such as glycerin, for example. This chamber is in communication with one or the other of the chambers M or N on the side of the piston—as, for example, by the hole e, Figs. 7 and 9.

In steering-checks of this character it is preferable to provide means for excluding air from the working chambers M and N, which are filled with a normally quiescent body of fluid, such as glycerin, and also to provide means for maintaining a constant supply of said fluid therein. This is accomplished by providing an auxiliary chamber containing fluid, which chamber is formed in the removable casting E. The construction of this casting is best shown on Sheet 2 of the drawings. The main body of the casting is circular or disk-like in form and is closely fitted into the casing A, the lower portion of the main body being seated on the shoulder D. Around the periphery of the casting is a groove which when the parts are assembled forms an annular chamber E', opening into the joint between the parts, and the liquid therein prevents the entrance of air. The inside of the casting is cut away to form an auxiliary fluid-chamber E³, and communication between it and the annular chamber E' is established by the holes E². A hub containing an opening E⁴ is provided to receive the hub or extension of the piston, and formed in the hub is a small annular chamber E⁵, which communicates with the annular chamber E' through holes E⁶ and with the large auxiliary chamber through holes E⁷. In order to strengthen the casting E, radial ribs E⁸ are provided, extending from a common center. These ribs are provided with openings E⁹, so that the liquid may pass freely from one section to another. Located below the main body of the casting E and formed integral therewith is a projection, the outer face of which is concentric with the inner wall of the casing A, while the inner face E¹⁰ is concentric with the center of movement of the actuating-shaft. This projection is cored out to form a part of the auxiliary fluid-containing chamber. The casting or removable member is retained in place by the pin T at the bottom and by the cover G at the top, which rests on the ribs E⁸ and is secured to the casing by screws O. A removable plug U is provided, Fig. 6, whereby the chambers may be filled with fluid without removing the cover.

Sleeved around the upper end of the piston-hub is an actuator H, which is retained in place by the bolt H'. The actuator is expanded at its outer end and is provided with bolt-holes H² on opposite sides of the center, whereby it may be secured to the steering-rods of the vehicle or to the movable portion of the apparatus when the check is used for

purposes other than steering. Formed on the upper side of the actuator are split lugs H³. Each one of these lugs contains a screw-threaded plug H⁴, and mounted within the plugs are spring-pressed buffers H⁵. By adjusting the position of the plugs the tension on the buffers can be varied.

Rigidly mounted on the upper end of the actuating-shaft J is a fork P, and formed integral with this fork or secured thereto by any suitable means is an arm P', which extends between the spring-pressed buffers H⁵. This arm is the medium through which motion is transmitted from the steering-handle to the wheels or to the other apparatus to be controlled. Due to the spring-pressed buffers the arm P' is permitted to move a certain amount before the act of steering takes place. This interval of lost motion is sufficient to permit one or the other of the valves L to open. For example, in Fig. 5 the valve-actuator K is shown as being in engagement with one of the valves, and the fluid in chamber M is passing into chamber N in the manner indicated by the arrow. Pivotaly mounted in the fork P is a block Q, which in turn is pivotaly secured to a fork R, that is rigidly connected to the steering rod or tube S.

Assuming that the parts are in the position shown in Fig. 2 and that it is desired to steer the vehicle or to adjust the relation of certain of the parts in case the check is applied to devices other than vehicles, the valve-actuator K is moved by means of the tube S. This causes one of the valves L to open and the arm P' to compress the spring of one of the buffers H⁵ and to permit the spring of the other buffer to extend slightly. As soon as the piston commences to move, due to the opening of one of the valves, the fluid in rushing from one of the main chambers into the chamber I within the piston will force open the second valve against the action of its spiral spring and permit the fluid to enter the second main chamber. As soon as the pressure is relieved on the tube S, the spring-pressed buffers bring the arm P' to a central position, or, in other words, to a position midway between them, and at the same time the springs L³ will close the valves and the parts will be in the locked position.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an apparatus of the character described, the combination of an element having a cylindrical wall, a second element eccentrically mounted with respect to the first, the two elements being capable of movement with respect to each other, a body of normally quiescent fluid for checking the free movements of the parts, and means for controlling the fluid.

2. In an apparatus of the character described, the combination of a cylindrical casing, a piston eccentrically mounted within the casing which divides the same into chambers, a piece having a face concentric with

the moving piston located within the casing, a body of normally quiescent fluid, and means for governing the passage of fluid from one chamber to another.

5 3. In combination, a fluid-containing cylindrical casing, a piston eccentrically mounted within the casing, a removable member fitting into the cylinder and provided with an extension which has a surface concentric with
10 the center of motion of the piston, and valves for controlling the passage of fluid from one side of the piston to the other.

4. In a motion-checking device, the combination of a cylindrical casing, a non-concentrically mounted piston working therein, a
15 removable member containing an auxiliary fluid-chamber mounted within the casing and provided with an extension having a surface which is concentric with the center of motion
20 of the piston.

5. In a motion-checking device, the combination of a casing, a piston eccentrically mounted for movement therein, a removable member closely fitting the casing and containing
25 a fluid-chamber, and a second fluid-chamber opening into the joint between the casing and the member for preventing the entrance of air.

6. In a motion-checking device, the combination of a cylindrical casing, a piston eccentrically mounted therein and provided with
30 a hub, a removable member through which the hub of the piston extends, and an annular fluid-containing chamber which surrounds the hub and opens into the joint between the
35 hub and said member for preventing the entrance of air into the space occupied by the piston.

7. In a motion-checking device, the combination of a cylinder, a piston having a hub
40 mounted therein, the centers of the piston and cylinder being non-coincident, a removable member, an annular fluid-containing chamber opening into the joint between the
45 cylinder and the member, and a second annular fluid-containing chamber which opens into the joint between the said member and the piston-hub.

8. In a motion-checking device, the combination of a cylinder, a piston having a hub
50 mounted therein, a removable member, an annular fluid-containing chamber opening into the joint between the cylinder and the member, and a second annular fluid-containing
55 chamber which opens into the joint between the said member and the piston-hub, the two annular chambers being eccentrically located with respect to each other.

9. In an apparatus of the character described, the combination of a cylindrical casing having a seat formed in one of its walls,
60 a removable member which has a peripheral groove and is adapted to be seated on the shoulder of the casing, a piston eccentrically
65 mounted within the casing, and a cover which rests on the removable member and is secured to the casing.

10. In a motion-checking device, the combination of a cylinder, means for closing the
70 ends, a piston mounted within said cylinder with its axis of movement disposed eccentrically with respect to the center of the cylinder, a body of fluid located on each side of the piston, valves for regulating the passing of fluid
75 from one chamber to another, and a means located within the cylinder, which fills a certain amount of space between one of the walls and the end of the piston and has a surface which is concentric with the center of motion
80 of the piston.

11. In combination, a cylinder, a piston having a hub, a grooved shaft extending through
said hub and capable of a slight independent movement, and a fluid-containing chamber
85 which communicates with the grooved portion of the shaft, the object being to prevent the entrance of air around the shaft.

12. In combination, a piston, bearings therefor, a cylinder containing a body of fluid, a
removable member containing an auxiliary
90 fluid-chamber, a fluid-chamber communicating with the piston-bearings, and a second fluid-chamber communicating with the joint between said member and the cylinder, both of said chambers drawing their fluid from the
95 auxiliary chamber.

13. In a motion-checking device, the combination of two elements which are movable
with respect to each other, an auxiliary fluid-containing chamber, and chambers opening
100 into the joints between the two elements, which draw their fluid-supply from the auxiliary chamber.

14. As an article of manufacture, an element for a motion-checking device, comprising
105 a body of metal having a cylindrical surface with an annular groove therein, an opening for receiving a piston-actuator, and a projection which has at least one curved surface that is eccentrically disposed with respect to
110 the main body.

15. As an article of manufacture, a removable member for a checking device, comprising
a substantially disk-like main body having
115 an opening to receive the piston-actuator, and a projection which has one surface that is concentric and one surface that is non-concentric with the main body.

16. As an article of manufacture, a piston for a checking device comprising a substantially
120 L-shaped structure having an extended upper hub through which the shaft passes with a lower hub that is arranged to be seated in a suitable bearing, and a chamber that is formed in the horizontal portion of the structure and communicates with the outside of
125 the piston through two valve-openings.

In witness whereof I have hereunto set my hand this 14th day of July, 1900.

HERMANN LEMP.

Witnesses:

WM. D. POOL,

JOHN MCMANUS.