

(No Model.)

3 Sheets—Sheet 1.

E. T. HERRICK.

AUTOMATIC CLUTCH FOR ELEVATORS.

No. 274,770.

Patented Mar. 27, 1883.

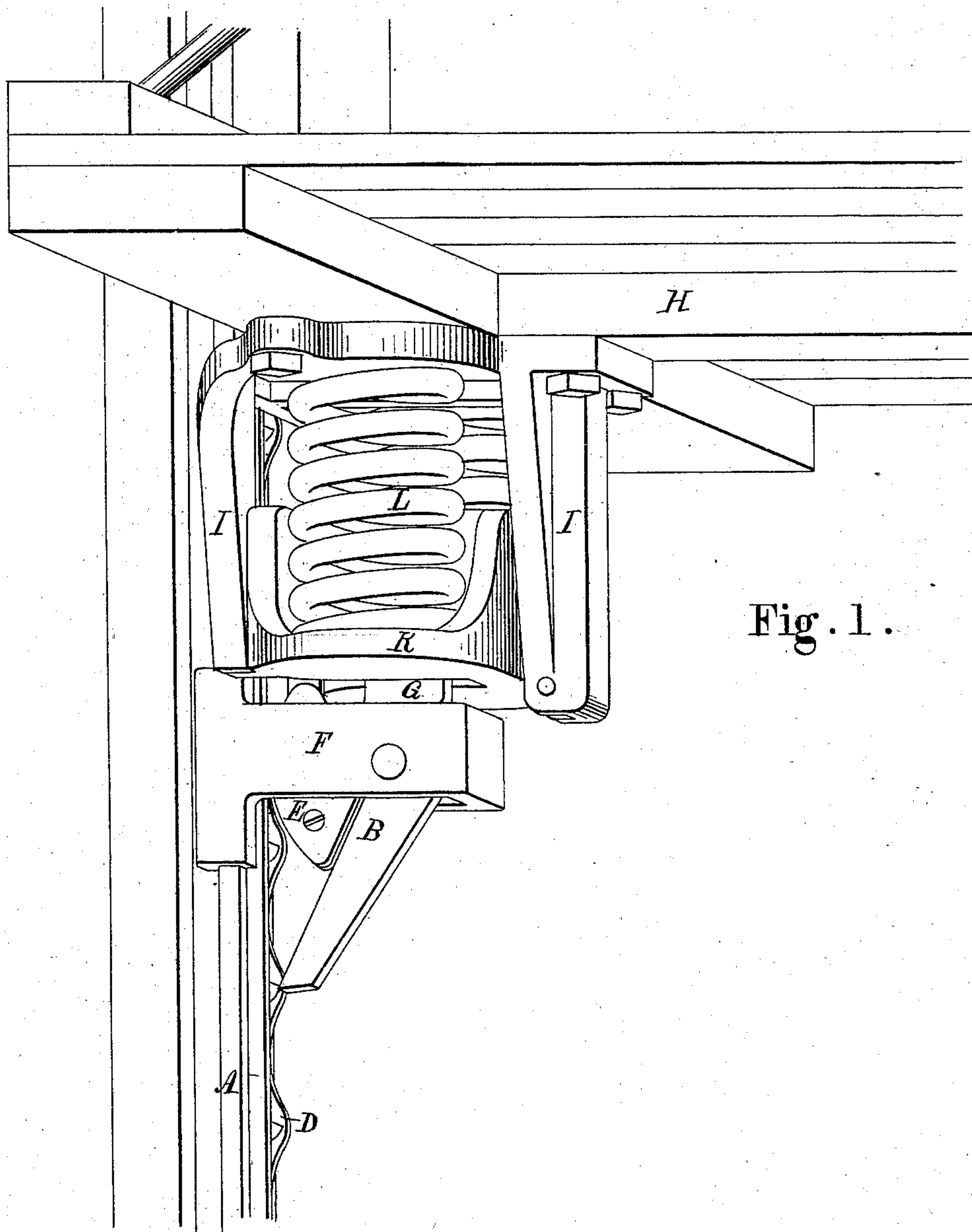


Fig. 1.

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Fig. 2.

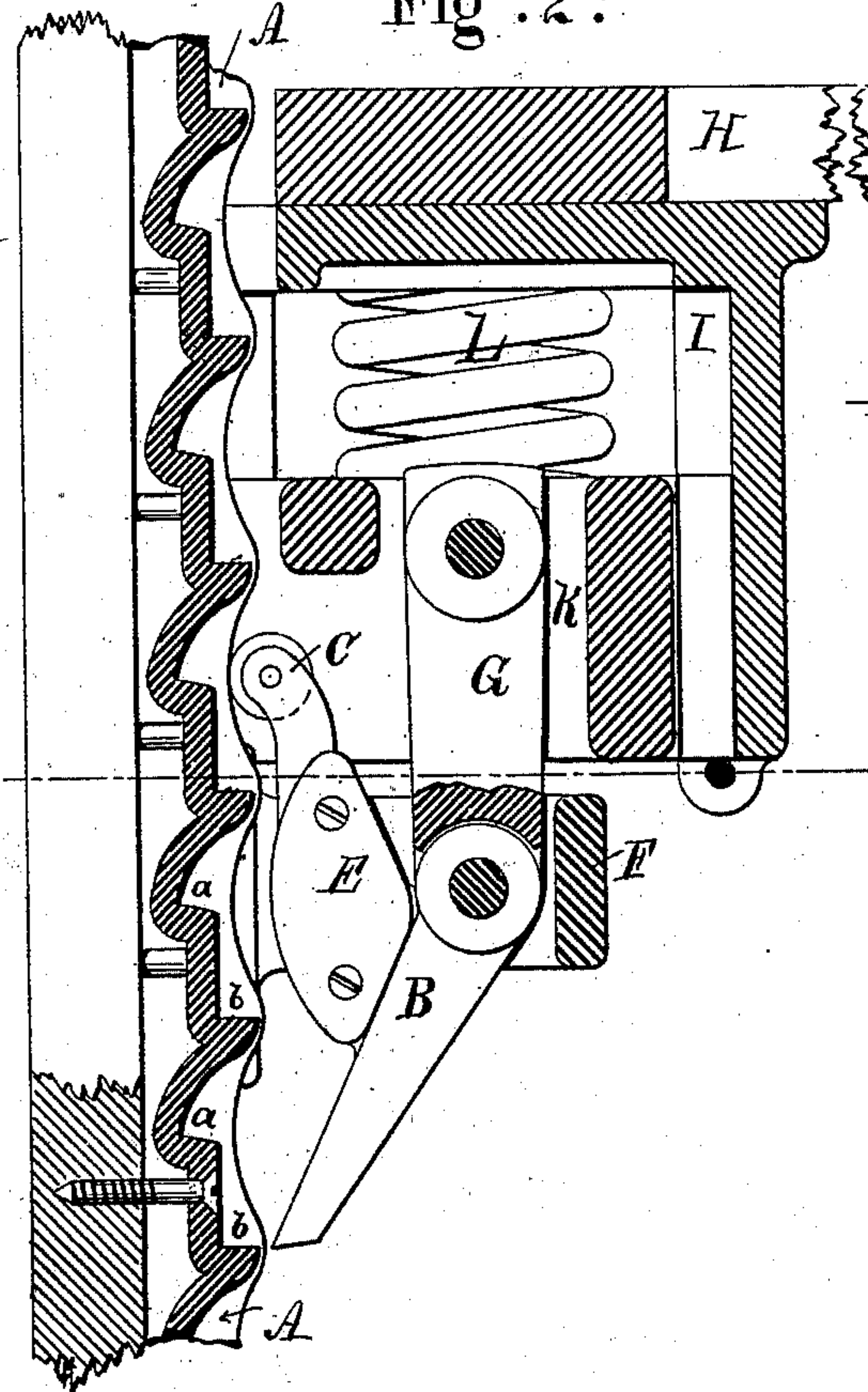


Fig. 3.

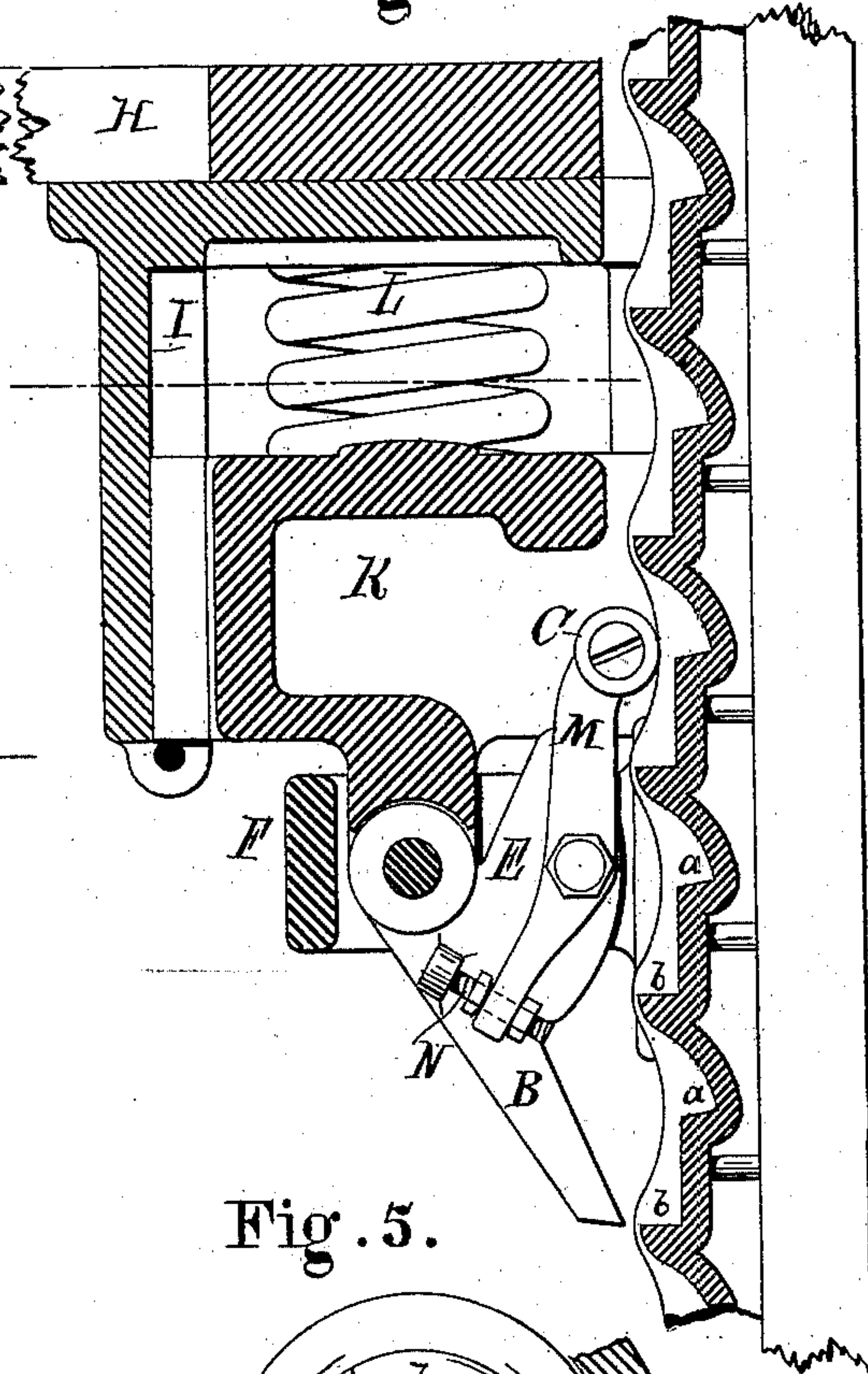


Fig. 4.

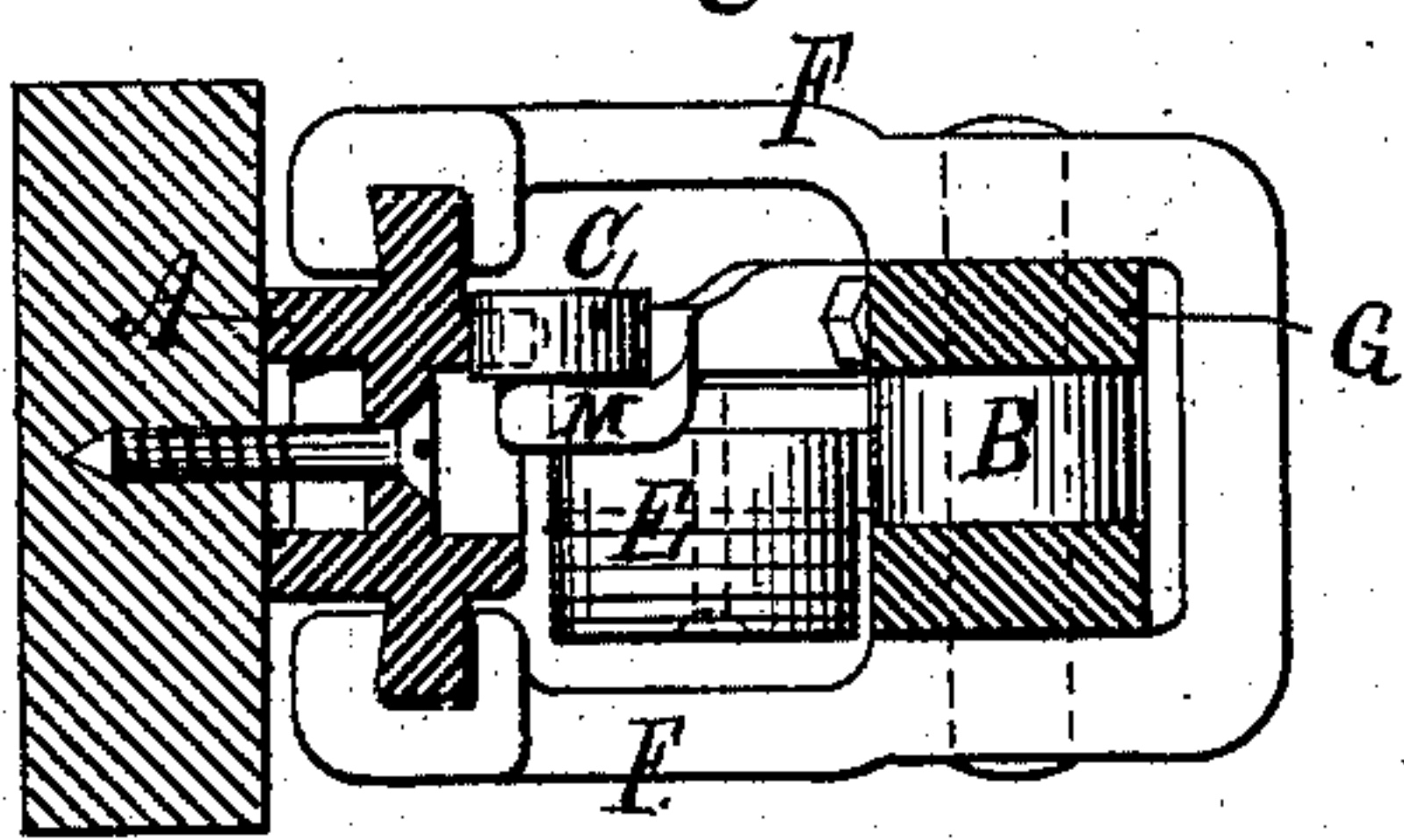
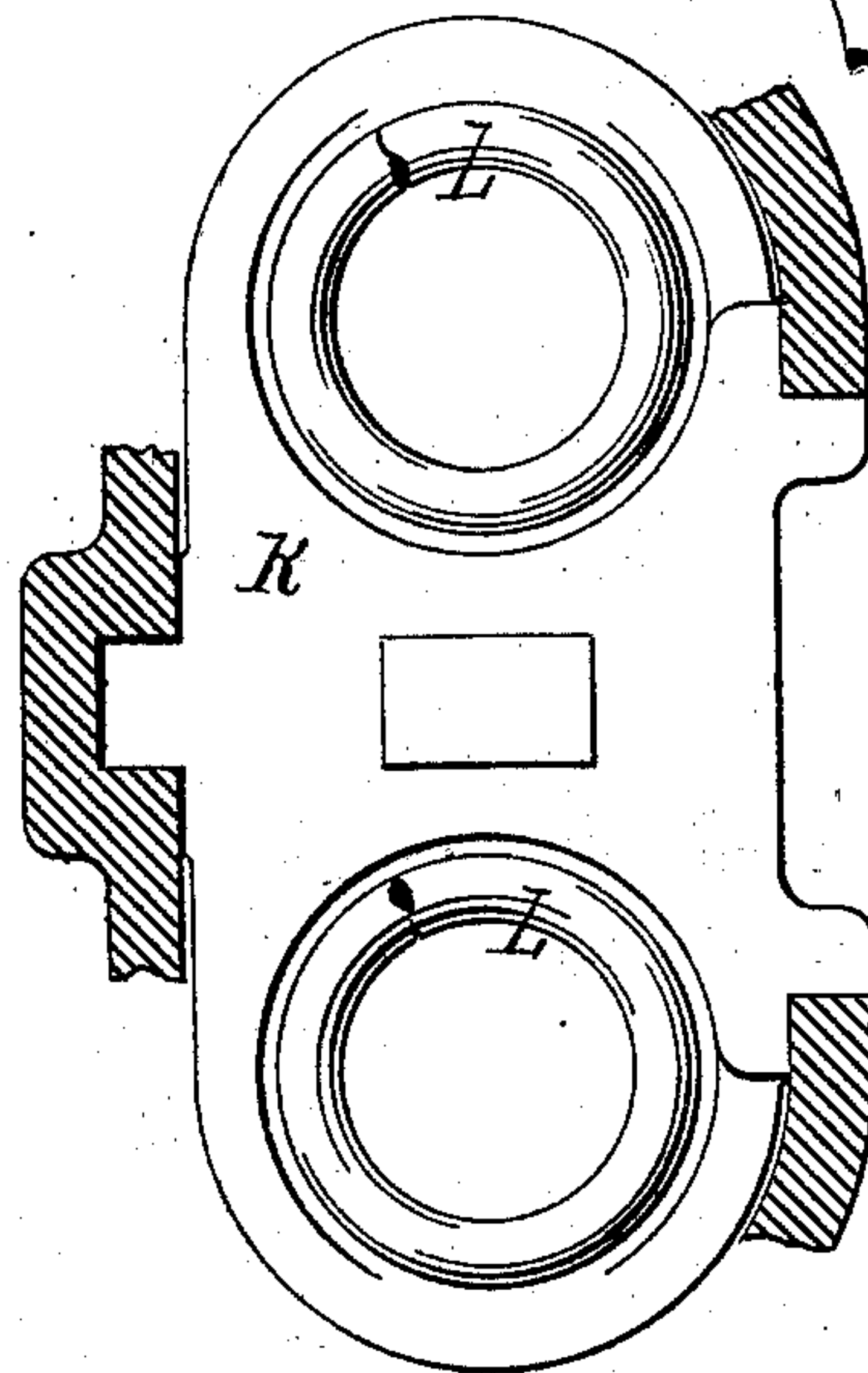


Fig. 5.



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Fig. 6.

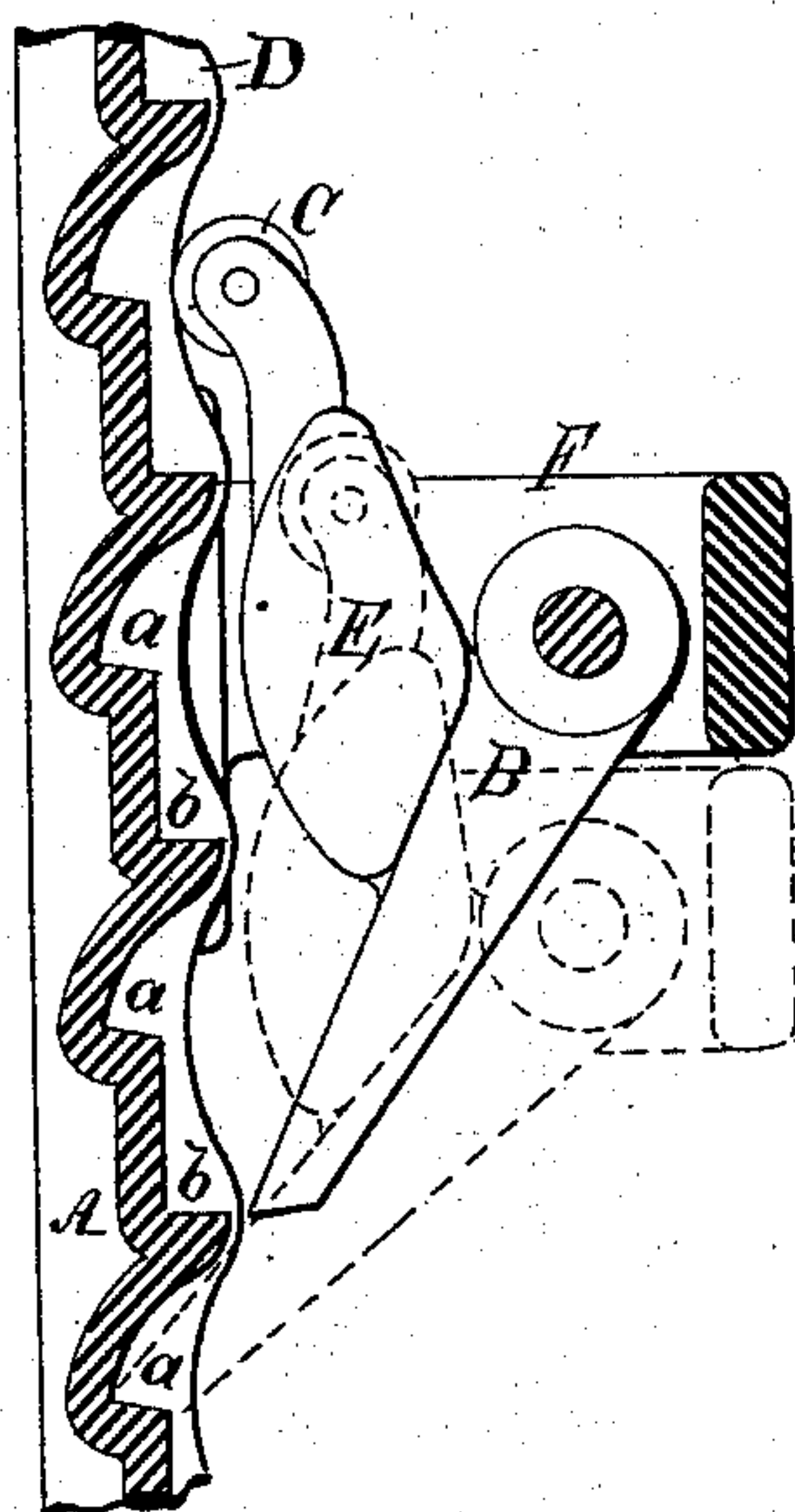
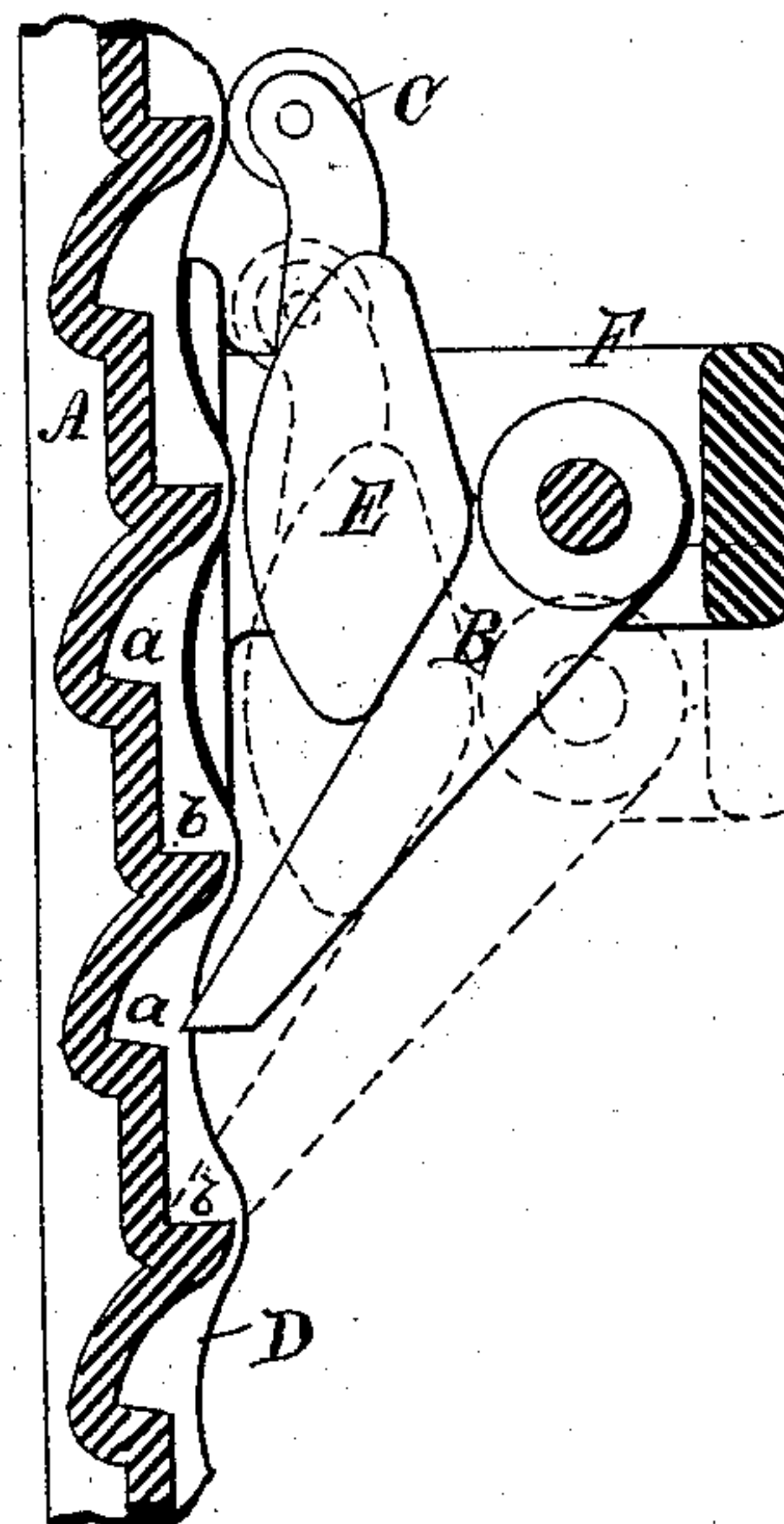


Fig. 7.



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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC CLUTCH FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 274,770, dated March 27, 1883.

Application filed August 18, 1881. Renewed October 14, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN T. HERRICK, of the city and county of Providence, and State of Rhode Island, have invented a new and useful Improvement in Automatic Safety-Clutches for Elevators; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to an improvement in automatic safety-clutches for all kinds of elevators or hoists.

The object of my invention is so to arrange an automatic safety-clutch that as soon as from any cause the platform of the hoist or elevator shall commence to descend quicker than desired, and before any momentum is acquired, the safety-clutch will be automatically engaged and the descent arrested.

The invention consists in the peculiar construction of the double rack and the safety-pawls, as will be more fully set forth hereinafter, and pointed out in the claims.

Figure 1 is a perspective view of part of a hoist or elevator platform provided with my improved safety-clutches. Fig. 2 is a sectional view of part of the hoist or elevator platform, showing the safety-clutch secured thereto, the double rack secured in the elevator-well, and the covered guide-rail. The pawl is connected with the platform by a link, so that the clutch can accommodate itself to the variations in the distance between the racks. Fig. 3 is a sectional view of part of the platform of a hoist or elevator, the double rack, the curved guide-rail, and the safety-clutch. Fig. 4 is a top view of the bracket in which the safety-clutch is hinged, showing the rack in section. Fig. 5 is a view, partly in section, showing the cushioned bearing by which the pawl or safety-clutch is connected with the platform of a hoist or elevator, so as to break the blow caused by the sudden arrest of the descending hoist. Fig. 6 is a view of the safety-clutch, shown in solid lines as guided by the curved rail on the concave portion of the rail and in broken lines as engaged with the inner shoulder of the rack. Fig. 7 is a view of the safety-clutch in solid lines, showing the rider-wheel

in contact with the convex portion of the guide-rail, and in broken lines the pawl as entered in the rail, as would be case if the elevator had suddenly descended at the point shown in solid lines.

In the drawings, A is the peculiarly-formed rack. B is the pawl; C, the rider-roll; D, the curved guide-rail, and E the bracket in which the pawl is hinged.

It will be observed that the guide-rail and the rack are made so as to conform to each other—that is to say, one of the shoulders of the rack is at the outward curve of the guide-rail and one at the inward curve. The object of this arrangement is to prevent any considerable descent of the hoist or platform before the same is arrested, and thereby prevent the possibility of the hoist or platform acquiring any momentum.

On examining Fig. 6 it will be observed that if an elevator provided with my improved safety-clutch were to descend suddenly the rider-wheel C, which is in the concave portion of the guide-rail, would roll toward the convex curve and enter the pawl in the rack at *a*, as is shown in broken lines, and if the position of the rider-wheel C is at the convex curve, as shown in solid lines in Fig. 7, the pawl B is already in the position to encounter the shoulder of the rack at *b*. By this peculiar construction of the rack, in connection with the guide-rail, the moment the descent is suddenly accelerated the hoist or platform is instantly arrested, and in this peculiar construction consists the main and most important value of this invention, and the broad and essential difference between it and all safety-clutches for hoists or elevators previously constructed. It is evident that the racks may be placed so that all the pawls enter the corresponding rack at the same time; or one set of racks may be arranged intermediate, so as to still more reduce the distance that the hoist or platform can fall before it is arrested.

E is a weight by which the rider-wheel is kept in contact with the guide-rail, so as to allow the pawl to oscillate in close proximity with the rack when the hoist or elevator ascends or descends in the ordinary way.

F is the bracket shown in top view in Fig. 100



4. This bracket slides on two ways formed on the sides of the rack A, and therefore follows the rack. As, however, there is of necessity some play to the hoist or cage, and as it is difficult to secure the rack at all places perfectly straight, the cage or hoist can be connected with the bracket F by means of a link, as is shown in Fig. 2, in which G forms the connecting-link; or it may be connected in any other suitable manner to allow free play of the cage or hoist.

In Figs. 2 and 3, H is the hoist or cage platform. To this platform, or any part of the cage or hoist above the cage, on the sides or below the same, the box I is secured, and in the box I the bearing-block K is placed and constructed so as to have a certain amount of vertical play, and the coiled springs L L or some elastic cushion is placed between the bearing-block K and the box I, so as to gradually arrest the descent of the cage or hoist when the pawl or pawls B B enter the rack. The bearing-block K is connected with the bracket F either directly, as is shown in Fig. 3, or by a flexible connection, as is shown in Fig. 2. To adjust the pawls with the greatest possible nicety, so as to oscillate as close as possible to the rack without engaging with the same until the hoist or elevator descends suddenly, the rider-wheel C is placed on a separate arm, M, which is hinged to the pawl B or to the weight E, and provided with an adjusting-screw, N, at its lower end, as is shown in Fig. 3.

By the use of this automatic safety-clutch an elevator may ascend or descend with great speed and in perfect safety as long as the descent is of uniform or nearly uniform velocity. As soon, however, as the descent is accelerated by the giving way of the supporting-rope or other devices, the automatic safety-clutch will engage with the rack or racks and instantly arrest the descent, thus converting any hoist or elevator into as safe a means for ascending or descending as a stair.

This peculiar automatic safety-clutch is peculiarly well adapted for inclined railroads, and, if properly constructed, it may be connected with each car by a link, so as to allow perfect freedom to the cars in the ascent or descent, as well as the action of the springs on the cars. The rack and guide-rail may be placed between the other rails, and should be constructed in a substantial manner, so as to insure perfect safety.

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

1. The combination, substantially as before set forth, of the hoist, the sliding bracket suspended therefrom by a link, the rack, the serpentine guide-rail, and the pawl hinged to the bracket and connected with a rider moving on said guide-rail.

2. The combination, substantially as before set forth, of the hoist, the movable bearing-block thereof, the springs, the sliding bracket suspended from the movable bearing-block by a link, the rack, the serpentine guide-rail, and the pawl hinged to the bracket and connected with a rider moving on said guide-rail.

3. The combination of a hoist with the box I, the bearing-block K, connected with the bracket F, having the safety-clutch hinged thereto, constructed to have vertical play, and the coiled springs L L, interposed between the block K and the box I, as and for the purpose set forth.

4. The combination, with the rack A and curved guide D, of the hinged pawl B, having the rider-wheel C, secured to the hinged arm M, provided with the adjusting-screw N, constructed to adjust the safety-clutch so as to allow the pawl to oscillate in close proximity to the rack, as described.

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