

W. E. PORTER.
PENDULUM CLAMP.

No. 549,743.

Patented Nov. 12, 1895.

Fig. 1.

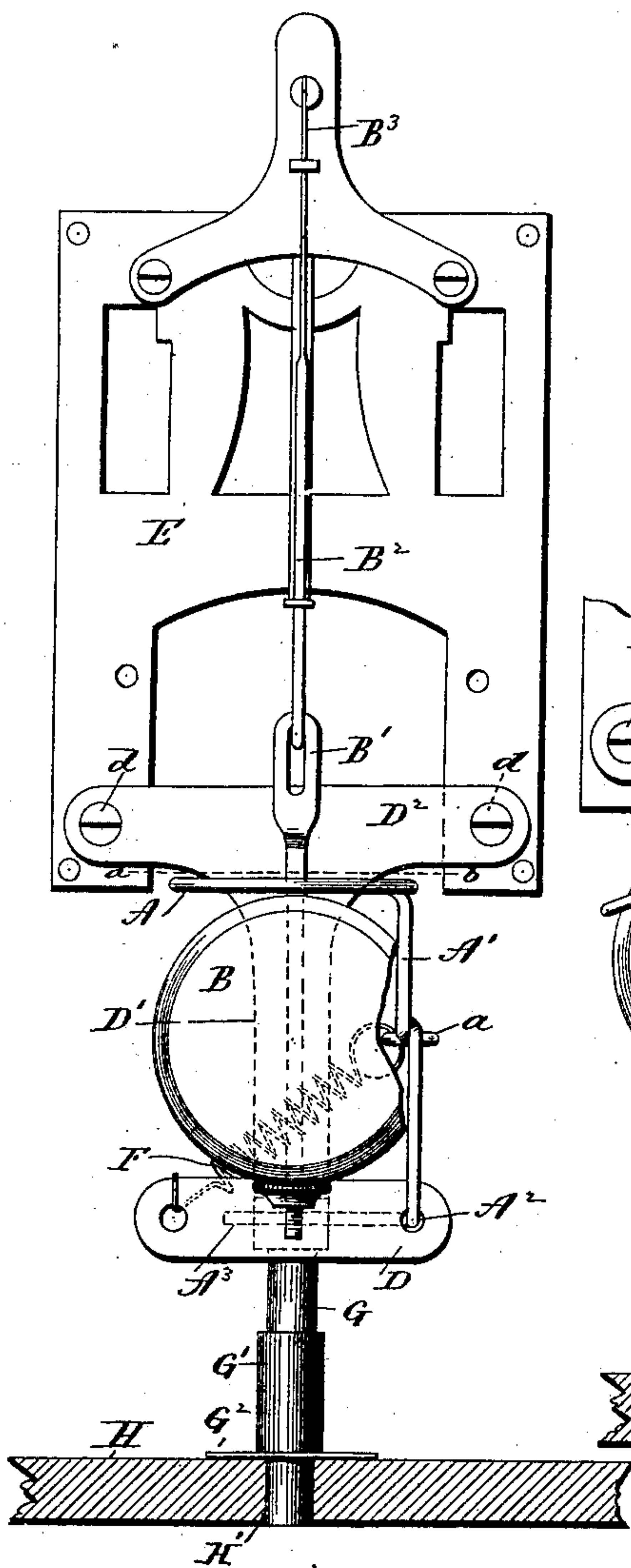


Fig. 2.

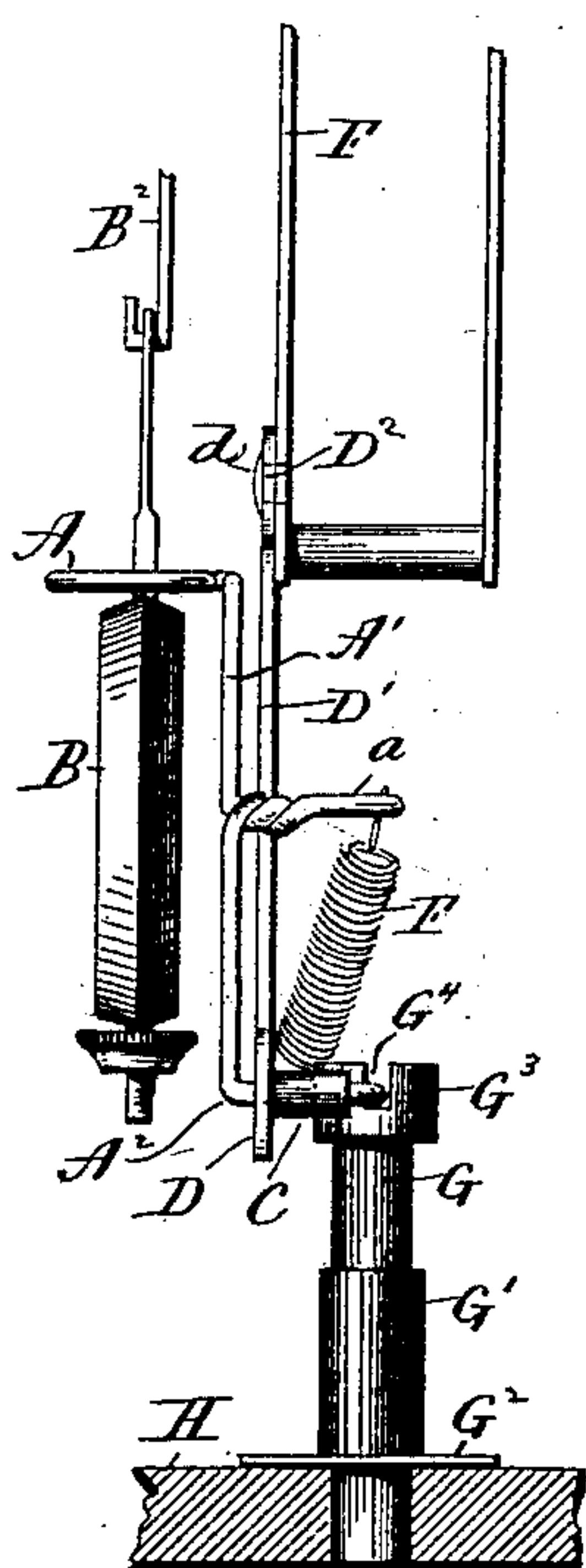


Fig. 3.

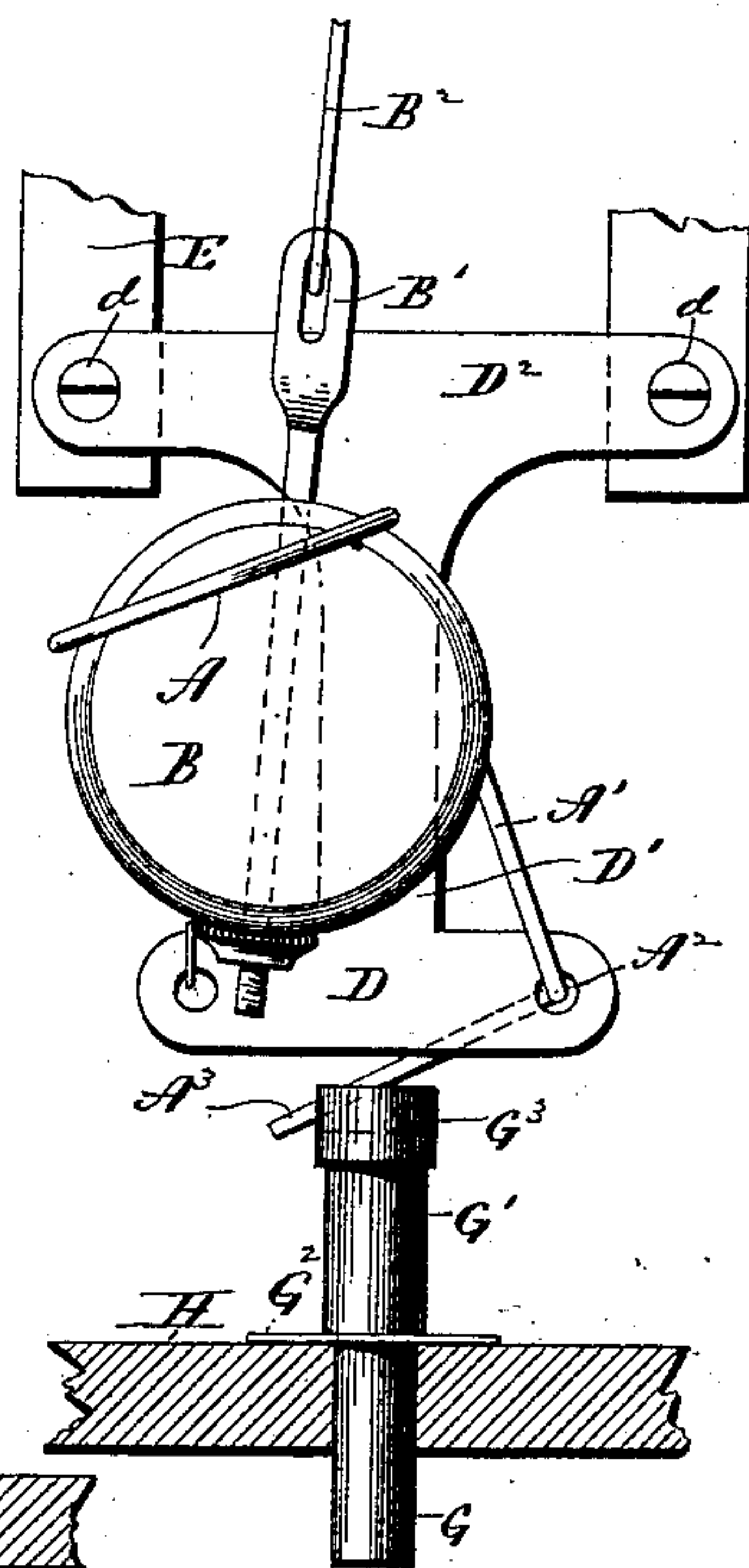


Fig. 5.

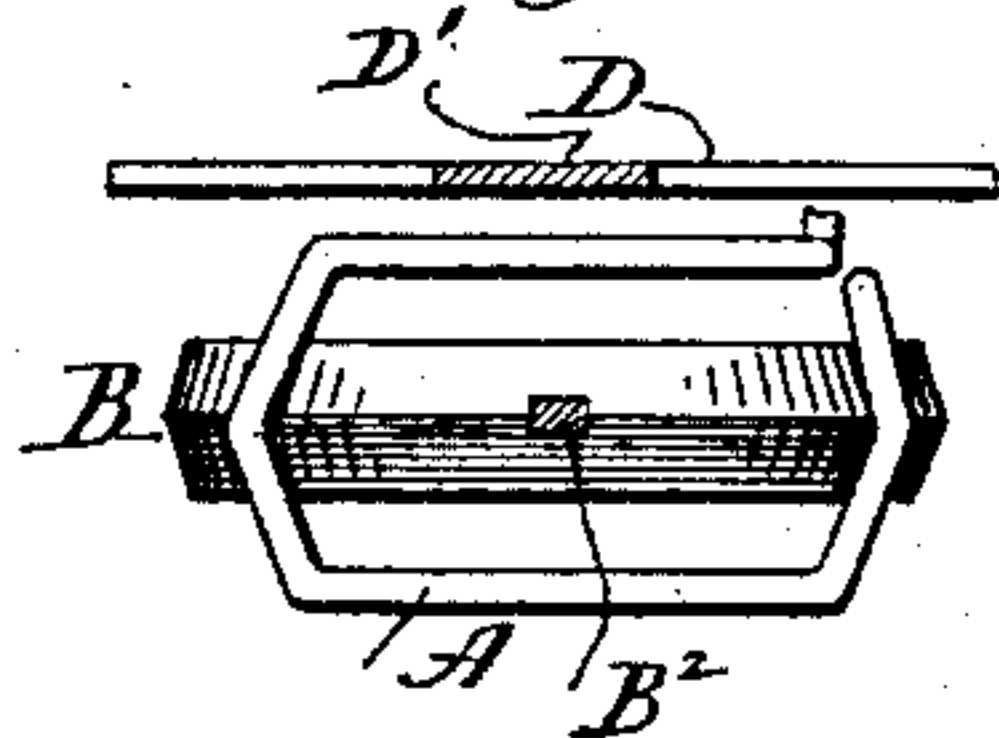


Fig. 4.

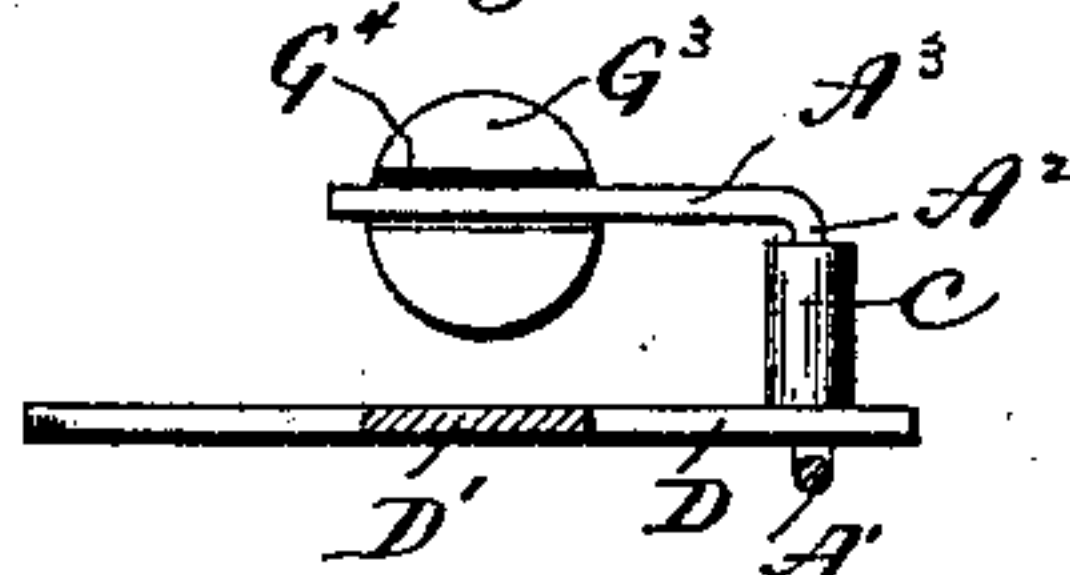
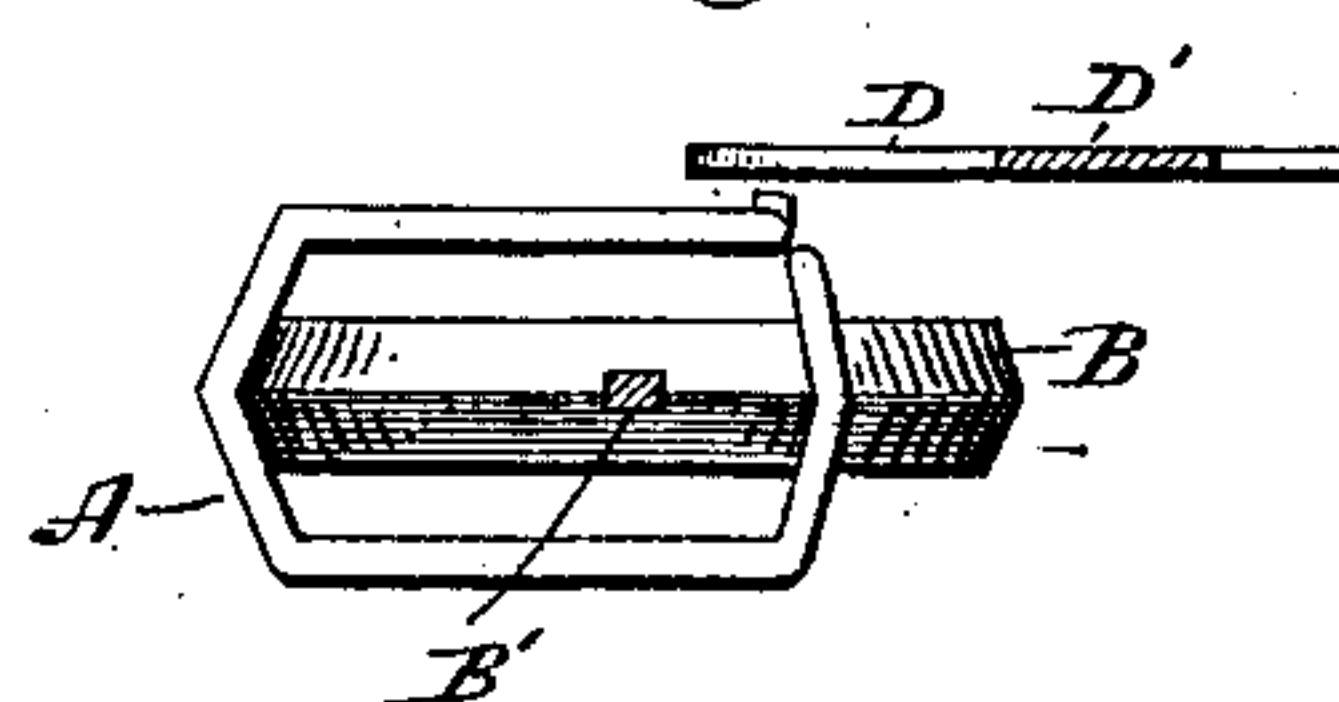


Fig. 6.



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Fig. 7

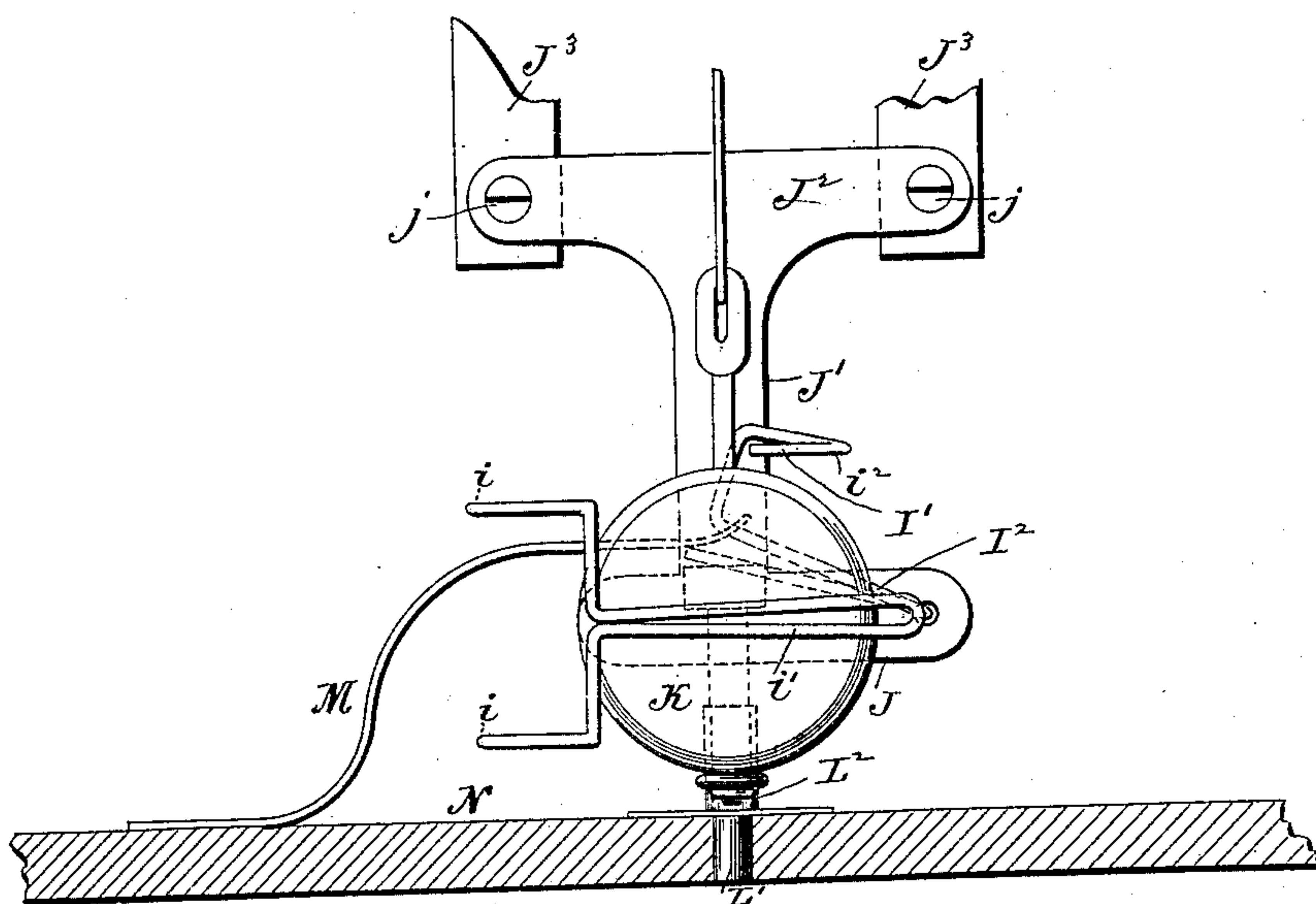


Fig. 8

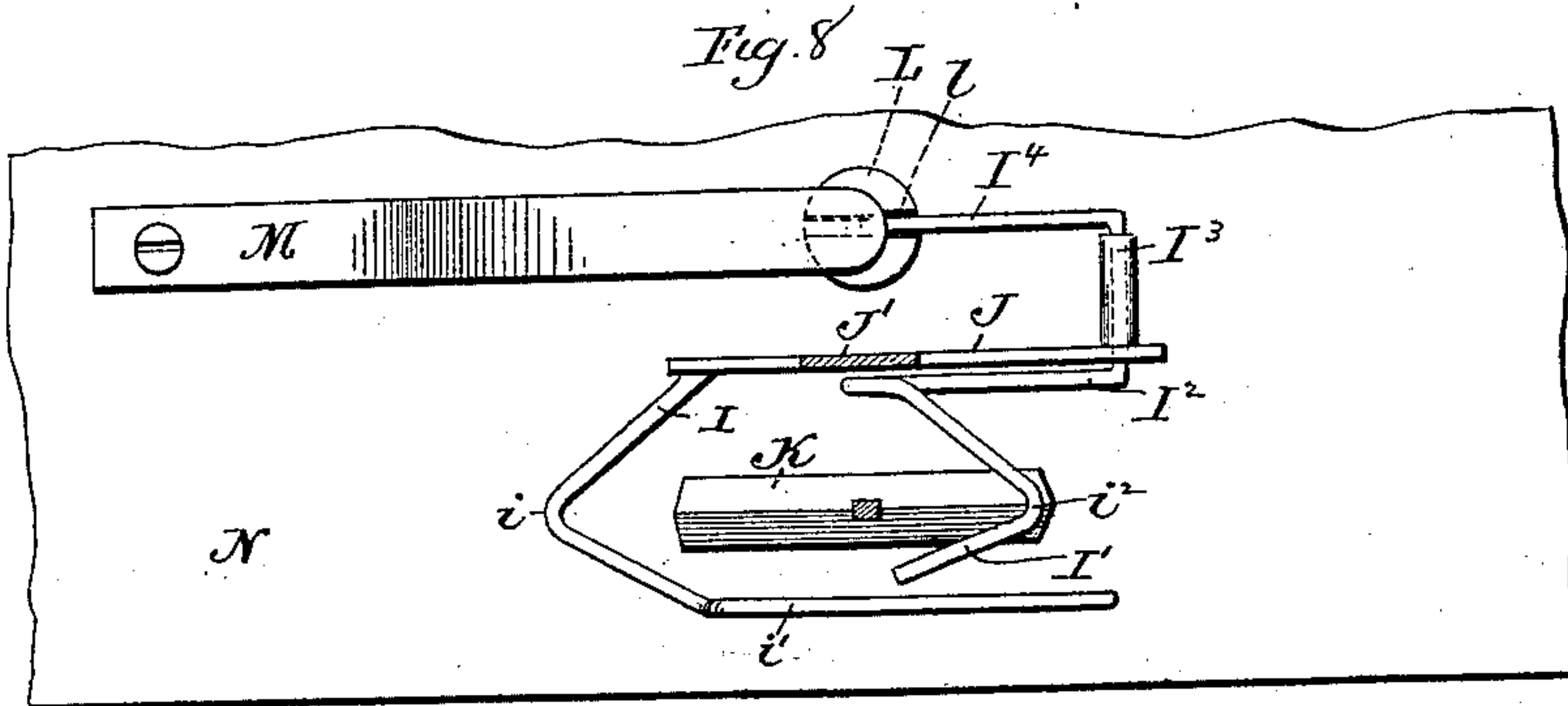
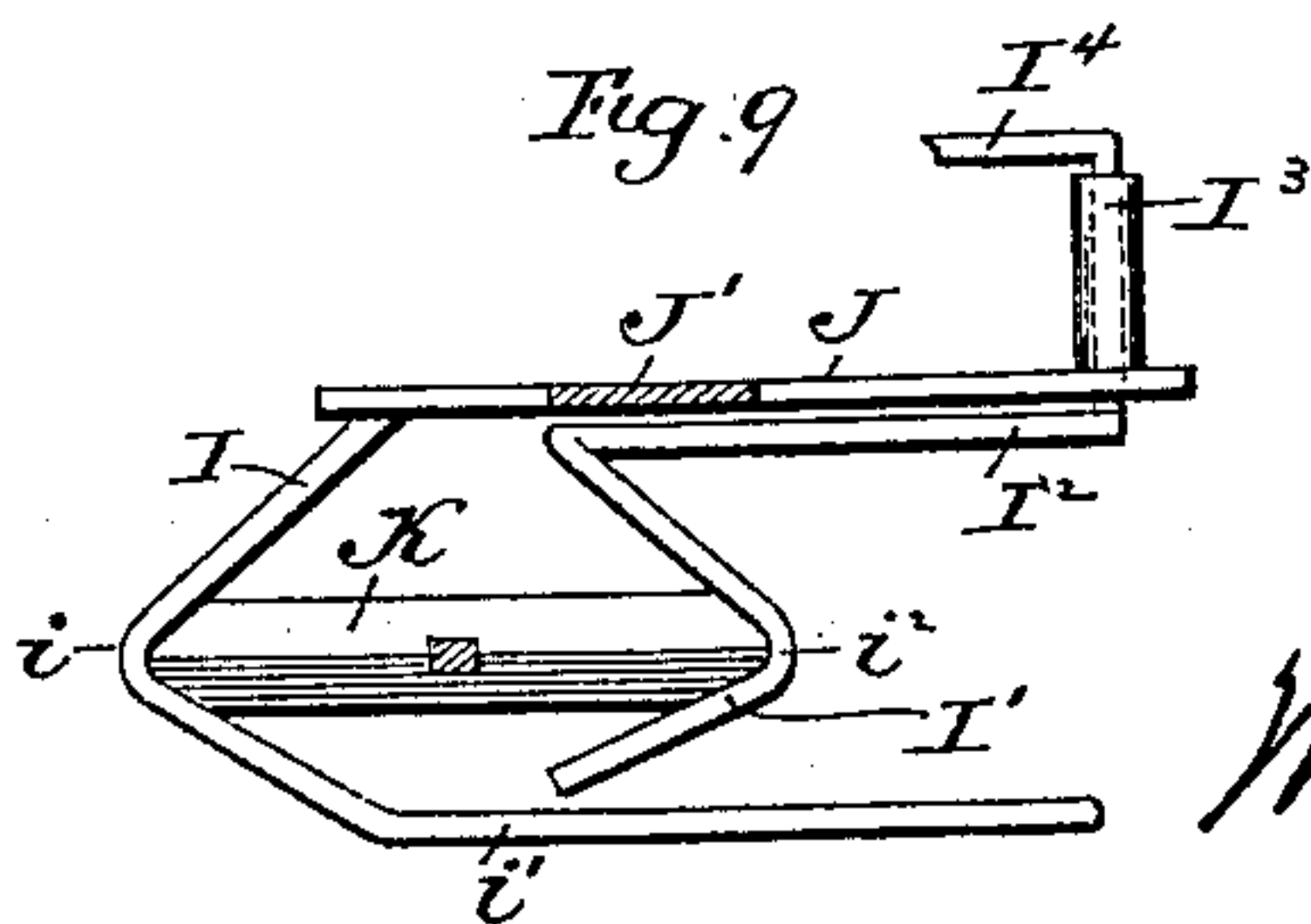


Fig. 9



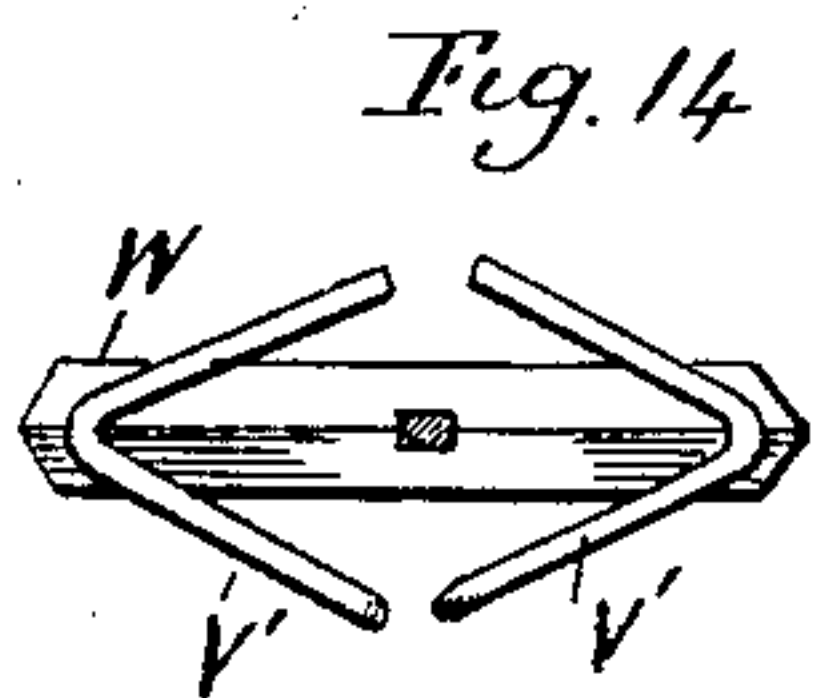
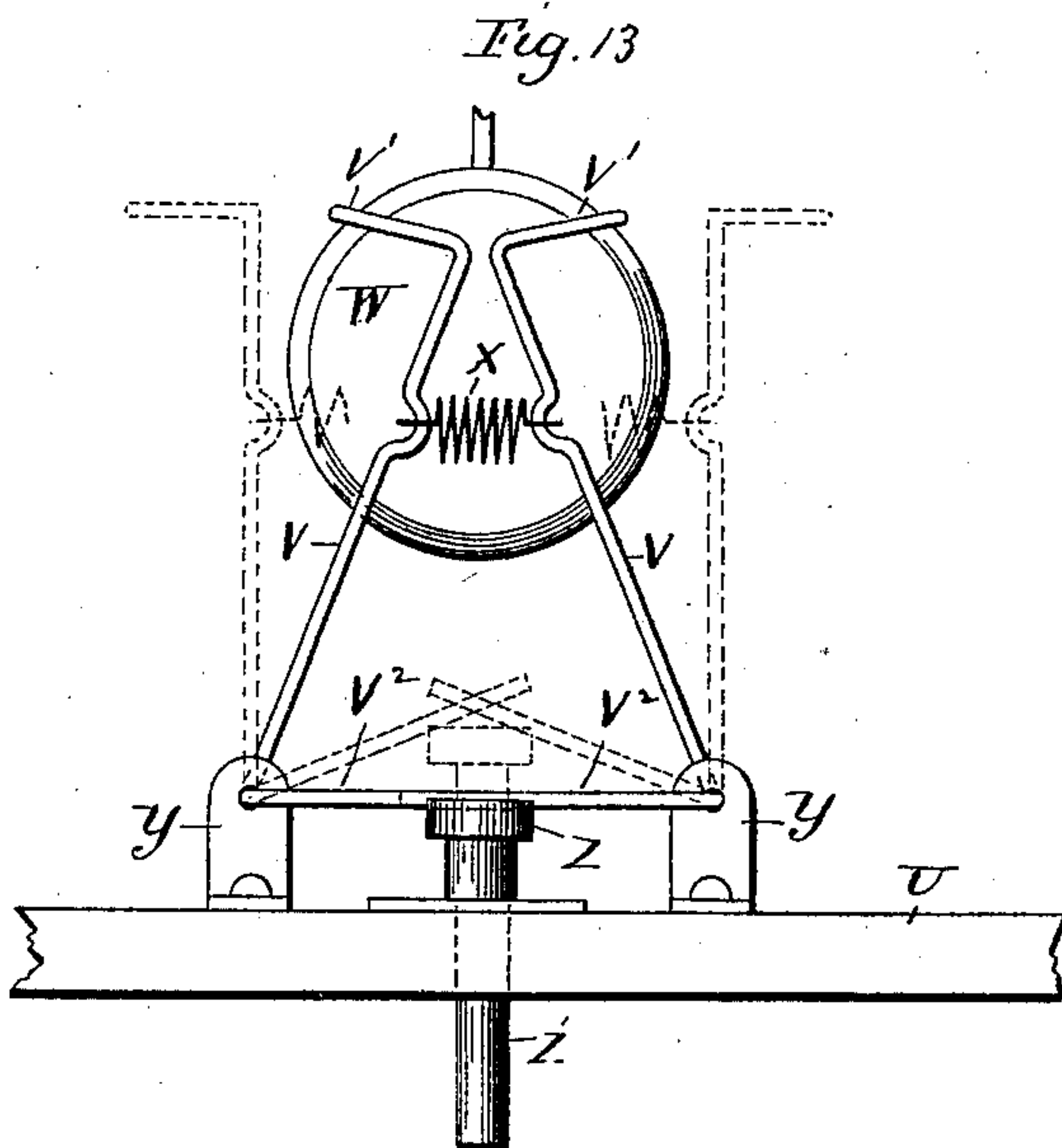
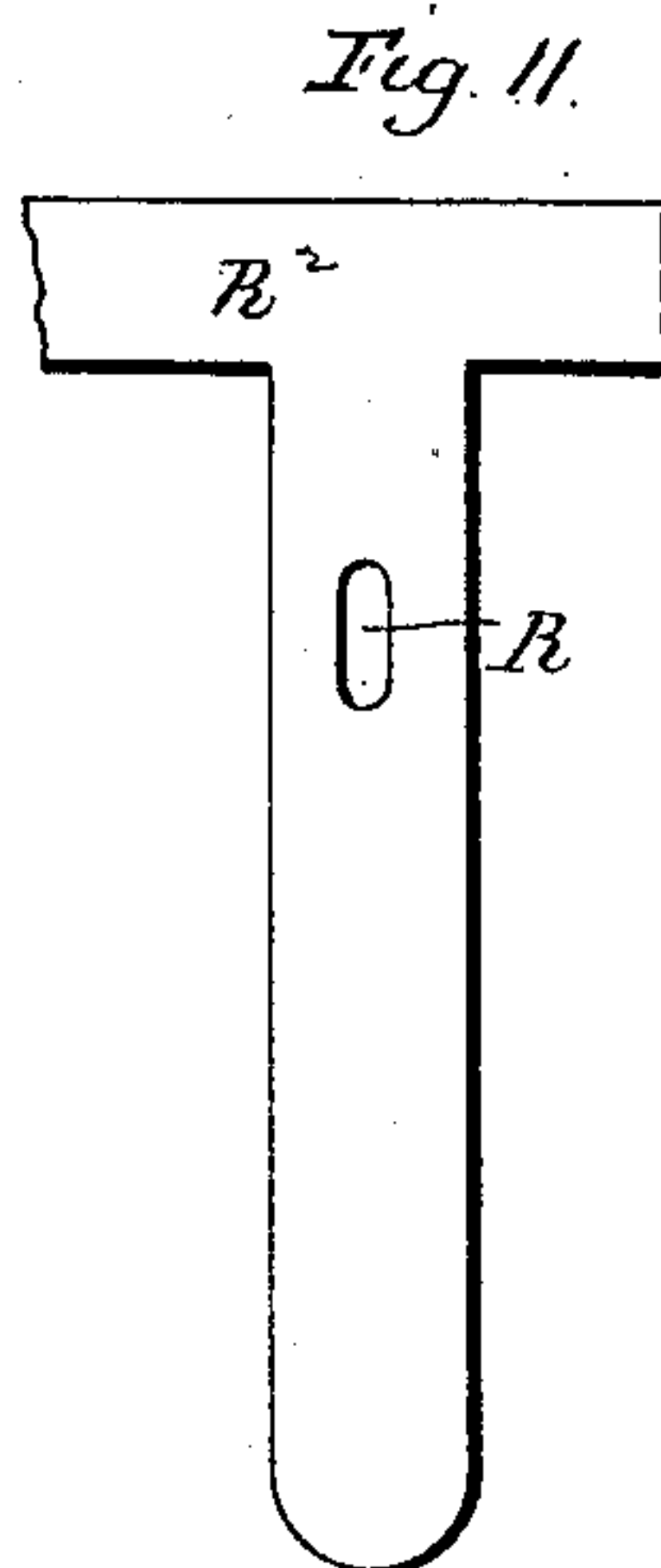
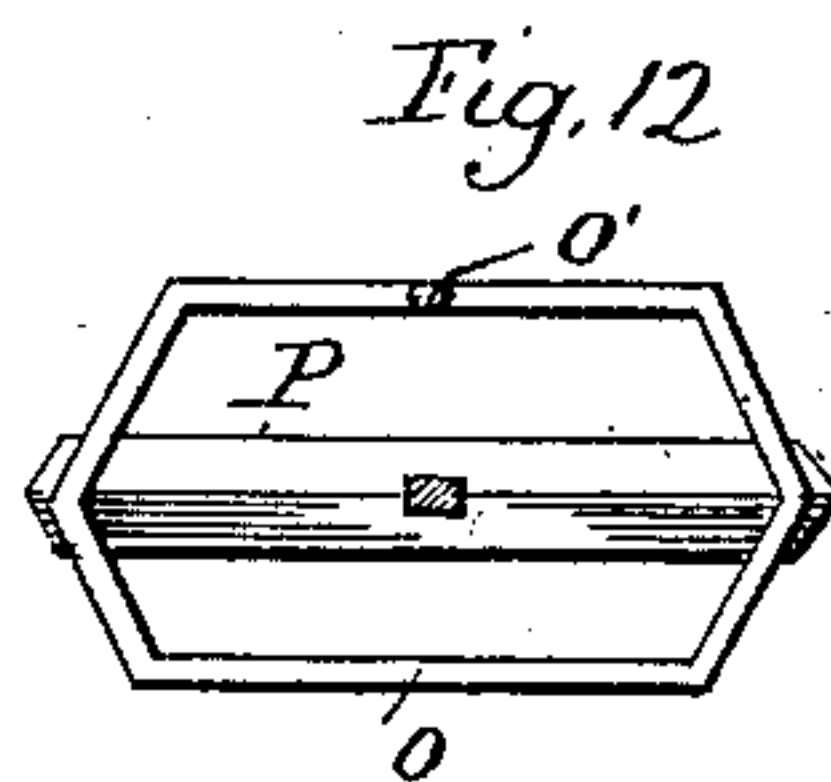
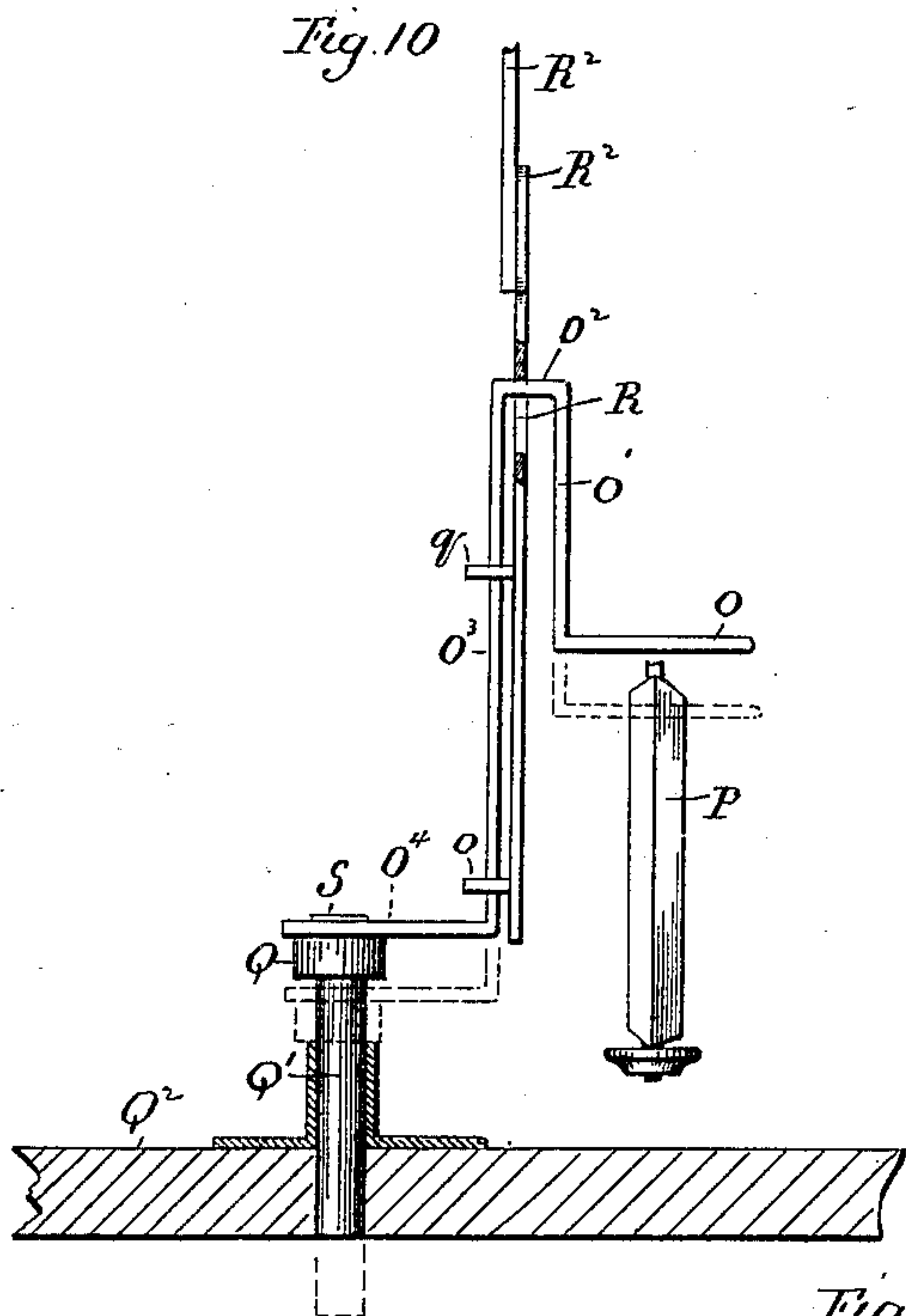
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UNITED STATES PATENT OFFICE.

WILSON E. PORTER, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE
NEW HAVEN CLOCK COMPANY, OF SAME PLACE.

PENDULUM-CLAMP.

SPECIFICATION forming part of Letters Patent No. 549,743, dated November 12, 1895.

Application filed January 14, 1895. Serial No. 534,847. (No model.)

To all whom it may concern:

Be it known that I, WILSON E. PORTER, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Clocks; and I do hereby declare the following, when taken in connection with the accompanying drawings, and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which
10 said drawings constitute part of this specification, and represent, in—

Figure 1, a broken view, in front elevation, of a pendulum-clamp constructed in accordance with my invention and shown in combination
15 with the front movement-plate of a clock and with the broken section of the case thereof, the clamp being represented in its retired position, in which it permits the clock to run; Fig. 2, a less comprehensive view in side elevation, showing the parts in the same adjustment; Fig. 3, a view in front elevation, but
20 less comprehensive than Fig. 1, and showing the clamp engaged with the pendulum to hold the same; Fig. 4, a small view, partly in plan and partly in section, showing the engagement of the operating-arm of the clamp with the slotted head of the plunger; Fig. 5, a
25 broken plan view showing the clamp retired above the pendulum-ball, which is free to swing; Fig. 6, a similar view showing the clamp depressed upon the pendulum-ball, which is thereby deflected and held in a position out of the perpendicular; Fig. 7, a view, partly
30 in front elevation and partly in section, of one of the modified forms which the invention may assume; Fig. 8, a plan view showing the same parts; Fig. 9, a similar but less comprehensive view showing the clamp in operation for gripping the pendulum-ball; Fig. 10, a
40 view in side elevation of still another form of my improvement, the clamp being shown in its retired position by full lines and in its operative position by broken lines; Fig. 11, a broken view in front elevation of the pendulum-clamp and bracket; Fig. 12, a broken
45 plan view of the clamp and pendulum-ball; Fig. 13, a view in front elevation of still another form which the device may assume, the device in this case being connected with the
50 bottom of the clock-case instead of with the clock-movement; Fig. 14, a plan view of the

ball and the upper ends of the two pivotal frames which form the clamp.

My invention relates to an improvement in clocks, the object being to provide them with
55 simple, reliable, and effectual pendulum-clamps for holding the pendulum ball and rod steady and against displacement when the clock is being handled and shipped.

A further object of my invention is to provide convenient means for automatically
60 starting a clock running, whereby the shaking and tilting of the clock customarily resorted to for starting it and often resulting in injury to or derangement of its parts are avoided.

With these ends in view my invention consists in a pendulum-clamp which is retired
65 when the clock is running.

My invention further consists in the combination, with a pendulum-clamp, of operating
70 connections for engaging the clamp with the pendulum-ball and disengaging it therefrom and holding it in a normally-retired position.

My invention further consists in the combination, with a pendulum-clamp, of operating
75 connections for applying and retiring the clamp, constructed to permit the pendulum to automatically start when the clamp is disengaged from it and retired.

My invention further consists in certain details of construction and combinations of
80 parts, as will be hereinafter described, and pointed out in the claims.

My improved device may assume a variety
85 of forms, of which I have chosen only a few for illustration; but I would have it understood that I do not limit myself to these, as other forms based on the same principle may be produced and employed in lieu of those
90 shown and described herein.

As shown in Figs. 1 to 6, inclusive, my improved device comprises a hollow oblong
95 clamp A, somewhat wider than the pendulum-ball B is thick, but shorter than the diameter of the same. As shown, its ends are made to form inwardly-opening angular grips to conform to and take hold of the angular edge
100 of the said pendulum-ball, which is adjustably mounted upon a stem B', which extends upward through the clamp for connection with the hooked lower end of the pendulum-

rod B². It will be understood that the clamp is long enough to afford the clearance required for the said stem, which swings back and forth in the clamp as the pendulum oscillates. The said clamp is located, as shown, at the upper end of a shank A', containing a horizontally-arranged rearwardly-projecting eye *a*, and merging at its lower end into a horizontal journal A², terminating in an operating-arm A³, standing at a right angle to the said journal. The said clamp, shank, journal, and arm are formed, as shown, from a single piece of wire. However, the integral construction of those parts is not necessary nor is it essential that they should be made of wire. The journal A² rocks in a horizontally-arranged bearing-sleeve C, extending rearwardly from one end of the lower horizontal cross-arm D of a plate-bracket, also comprising a central upright arm D', and a horizontal upper cross-arm D², the opposite ends of which are fixed by screws *d d* to the rear plate E of the clock-movement, which may be of any approved construction and does not need description.

The clamp is applied to the pendulum-ball by an operating connection consisting in a diagonally-arranged spiral spring F, which is connected at its upper end with the eye *a* of the shank A', before referred to, and at its lower end with the opposite end of the lower cross-arm D, the said spring exerting a constant effort to draw the shank A' and hence the clamp A downward, so that the clamp will engage with the grip and hold the pendulum-ball, as shown in Fig. 3.

I may mention here that inasmuch as the draft, so to speak, of the clamp is downward it places the pendulum-rod B² under tension and also the delicate flat spring B³, by which the rod is suspended from its upper end, whereby the rod and spring are prevented from endwise movement. All danger of either breaking or distorting the rod or spring is thus avoided. The clamp is retired and normally maintained in an elevated retired position above the pendulum-ball by means of an operating connection consisting, as shown, of a plunger G, mounted in a vertically-arranged sleeve G', the lower end of which has a horizontal flange G², adapting it to be secured to the inner face of the base H of the clock-case. The extreme upper end of the plunger is provided with a head G³, having in its upper face a transverse slot G⁴, which receives the operating-arm A³, as clearly shown in Fig. 4. The said head has the additional function of forming a stop for limiting the outward movement of the plunger, which it does by engaging with the inner end of the bearing-sleeve G' aforesaid. The said base H of the clock-case has formed in it, in line with the sleeve G', an opening H', receiving the outer end of the plunger, which is moved back and forth therein.

It will be readily seen that when the clock

is in any position other than properly set on its base—upon a shelf or table or box or what not else—there will be nothing to restrain the plunger from outward movement through the opening in the base of the case, and nothing, therefore, to prevent the spring from asserting itself in drawing the clamp down upon the pendulum-ball and holding the same firmly against movement in any direction, no matter how roughly the clock may be handled in being carried about either in or out of a packing-case nor in what position it may be placed.

Now if the clock be set down properly upon its base the outer end of its plunger will be engaged by the shelf, table, or what not else upon which it may be placed and forced inward against the tension of the operating-spring, which will be overcome by the weight of the clock. As the plunger moves inward, it acts through the arm A³, journal A², and shank A' to positively lift and retire the clamp, which will be maintained in a normally-elevated retired position, in which it does not in any way interfere with the free oscillation of the pendulum as long as the clock is in its running position. On the other hand the moment the clock is lifted so as to relieve its plunger of the inward pressure upon it the operating-spring will act to draw the clamp down upon the pendulum-ball, which is thus automatically gripped and thereafter held until the clock is again placed in its running position, in which its clamp is retired, and in which, indeed, the clamp is of no use, whether the clock is actually running or not, for so long as the clock is in that position the pendulum will do no injury to itself or the clock-movement. Therefore by means of my improvement I provide for automatically clamping and holding the pendulum when the clock is in any position inimical thereto.

It will be noticed that when a clamp constructed as shown in Figs. 1 to 6 is depressed so as to engage with the pendulum it moves in an inclined path and swings the same to one side of its plumb position, as shown in Figs. 3 and 6. Therefore when the clock is set down upon a table or shelf or what not else and the clamp released the pendulum will derive a starting impetus from the action of gravity, so that unless the clock is set down very cautiously and the clamp is gradually retired the act of setting it down and retiring the clamp will also effect the starting of the clock. This is obviously very convenient, as it avoids the shaking or tilting of the clock, which must otherwise be resorted to for starting it, and which is not only difficult if the clock be heavy, but also very liable to result in bending or distorting the delicate spring at the upper end of the pendulum-rod or injuring or displacing some other feature of the mechanism. In place of relying upon gravity to start the clock, as described, some

provision might be made for giving the pendulum ball or rod a push upon release of the latter from the clamp.

In the modified construction shown by Figs. 7, 8, and 9 of the drawings the pendulum-clamp consists of a fixed member I and a movable member I', the fixed member I being formed from wire and rigidly secured in a horizontal position to one end of the lower horizontal cross-bar J of a plate-bracket, which also comprises a central upright J' and the horizontal upper cross-bar J², the ends of which are secured by screws j to the lower end of the rear movement-plate J³ of the clock. The said fixed member of the cross-bar is bent to form two inwardly-opening angular grips i, located one above the other in horizontal planes below the upper and lower edges of the pendulum-ball H, the adjacent edge of which they receive. The fixed member I of the clamp also includes a horizontal loop-shaped finger i', located in front of the pendulum-ball K and forming an extension of the grips i i and located midway between the planes of the same. The movable member I' of the clamp is bent to form an inwardly-opening angular grip i², located at the upper end of a shank I², merging at its lower end into a horizontal journal I³, terminating in an operating-arm I⁴, the end of which rests in a transverse slot l, formed in the head L, located at the upper end of a plunger L', mounted in a bearing-sleeve L² and corresponding in construction and operation to the plunger G before described. A flat spring M, secured to the bottom N of the clock-case, engages with the head L and exerts a constant effort to draw the movable member I' of the clamp down upon the pendulum-ball H, which, as shown in Figs. 7 and 8 of the drawings, is free to oscillate when the movable member I' of the clamp is in its retired position, in which it is maintained by the plunger against the tension of the spring M when the clock is resting upon a shelf or table. When, however, the clock is lifted, the spring will at once act to project the plunger through the bottom of the case and draw the movable member of the clamp down upon the pendulum-ball H, which will then be firmly gripped between the fixed and movable members of the clamp, as shown in Fig. 9, the ball being carried to one side of its vertical position, so that when the clock is set down again the action of gravity will swing the pendulum back and start it in motion unless the clock is set down so gently that the pendulum does not acquire any inertia in going back to a vertical position. This modified construction is therefore self-starting, as well as the construction previously described.

In the modified construction shown in Figs. 10, 11, and 12 of the drawings the horizontally-arranged clamp O, which is a hollow oblong clamp with inwardly-opening angular ends, is arranged to be moved up and down in a purely-vertical path. When, therefore, it is engaged with the pendulum-ball P, it does

not swing the same to one side or the other, but only exerts a straight downward draft upon the same. The pendulum is securely held and prevented from being displaced or damaged; but it is not held in such a position that it will automatically start the clock when the same is set up. The said clamp is located at the lower end of a shank comprising a vertical outer member O', a horizontal reach O², and a long inner vertical member O³, terminating at its lower end in a horizontal operating-arm O⁴, which rests in a slot formed in the head Q of a plunger Q', mounted in the bottom Q² of the clock-case. The reach O² of the shank plays up and down in a vertical slot R, formed in the plate-bracket R', which is secured to the rear movement-plate R², while the member O³ of the shank of the clamp moves up and down in guides o, located upon the inner face of the bracket. A spring S, engaging with the arm O⁴ and with the head Q, exerts a constant effort to draw the clamp down upon the pendulum-ball P, which it grips with a downward draft when the clock is in any position inimical to the safety of its pendulum.

In the modified construction shown by Figs. 13 and 14 of the drawings the clamp, instead of being connected with the clock-movement, is connected with the bottom U of the clock-case. In this construction the clamp consists of two corresponding pivotal frames V V, having their upper ends bent to form angular grips V' V' to take hold of the angular upper edge of the pendulum-ball W, on opposite sides of the center thereof. These grips are drawn onto the ball by two corresponding horizontally-arranged spiral springs X X, connecting the said frames near the upper ends thereof. The said frames V V are mounted in brackets Y Y, secured to the bottom of the clock-case, and are provided with operating-arms V² V², which enter a wide slot formed in the head Z of a plunger Z', mounted in the bottom of the clock-case U. When the clock is set up in position for running, the plunger is forced inward and acts through the medium of the arms V² V² to overcome the tension of the springs X and holds the frames V in their vertical positions, in which they are shown by Fig. 13 of the drawings and in which they do not interfere with the free operation of the pendulum-ball W. On the other hand, when the clock is lifted for handling it or for packing it for transportation, so that the outer end of the plunger is relieved, the springs at once act to draw the frames V V toward each other and to grip the pendulum-ball between their angular grips V' V'. The device just described also imposes a downward draft upon the pendulum, so as to hold the same firmly in place and to keep its pendulum rod and spring straight; but this mechanism does not assist in the automatic starting of the clock.

The several constructions which I have described make it obvious that still others may

be resorted to. Therefore I do not limit myself to the exact construction shown and described, but hold myself at liberty to make such changes as fairly fall within the spirit and scope of my invention. Thus I might apply my device to hanging clocks, in which case the plunger would be arranged to project through the back of the clock-case, so that it would be pushed inward thereinto by the wall in hanging the clock.

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

1. A clock provided with a pendulum clamp constructed to engage directly with the pendulum ball and hold the same against movement, and to be retired for permitting the normal oscillation thereof and means combined with the clamp for operating it, substantially as described.

2. A clock provided with a pendulum clamp constructed to engage directly with the pendulum ball, and place the same under downward draft, and to be retired to permit the pendulum to normally oscillate and means combined with the clamp for operating it, substantially as described.

3. A clock provided with a pendulum clamp arranged to engage directly with the pendulum ball and place it under downward draft when the clock is not running, and to be retired to permit the pendulum to oscillate, and means combined with the clamp for operating it and including a spring which draws the clamp down upon the ball, substantially as described.

4. A clock provided with a pendulum clamp arranged to engage directly with the pendulum-ball when the clock is not running, and to be retired to permit the pendulum to oscillate, means projecting beyond the clock-case for retiring the clamp, and a spring exerting a constant effort to apply the clamp, and acting in opposition to the said means for retiring it, substantially as described.

5. A clock having a pendulum clamp arranged to engage directly with the pendulum

ball when the clock is not running, a plunger projecting through the clock case and connected with the clamp, and arranged to be pressed inward for retiring the clamp when the clock is set up for running, and a spring for applying the clamp and acting in opposition to the plunger, substantially as described.

6. A clock having a pendulum clamp adapted to be engaged directly with the pendulum ball for holding the same when the clock is not running, and means projecting outside of the clock case for retiring the clamp to release the ball, the said parts being constructed to give the ball a starting impulse when it is released by the clamp, substantially as described.

7. A clock having a pendulum clamp comprising an oblong frame arranged above the pendulum ball, the stem of which passes upward through the frame in which it is free to oscillate when the clock is not running, but which grips the ball to hold it with a downward draft when it is depressed, substantially as described.

8. A clock having a pendulum clamp constructed to grip the pendulum ball, and a bracket attached directly to the clock-movement and having the said clamp mounted upon it, substantially as described.

9. The combination with a clock-movement, of a bracket secured thereto, a pendulum clamp connected with the bracket and adapted to engage directly with the pendulum for placing the same under a downward draft, a plunger mounted in the clock case and projecting through the same, and a spring connected with the clamp and plunger and acting in opposition to the latter, substantially as described.

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

WILSON E. PORTER.

Witnesses:

GEO. A. WHITNEY,
WALTER C. CAMP.