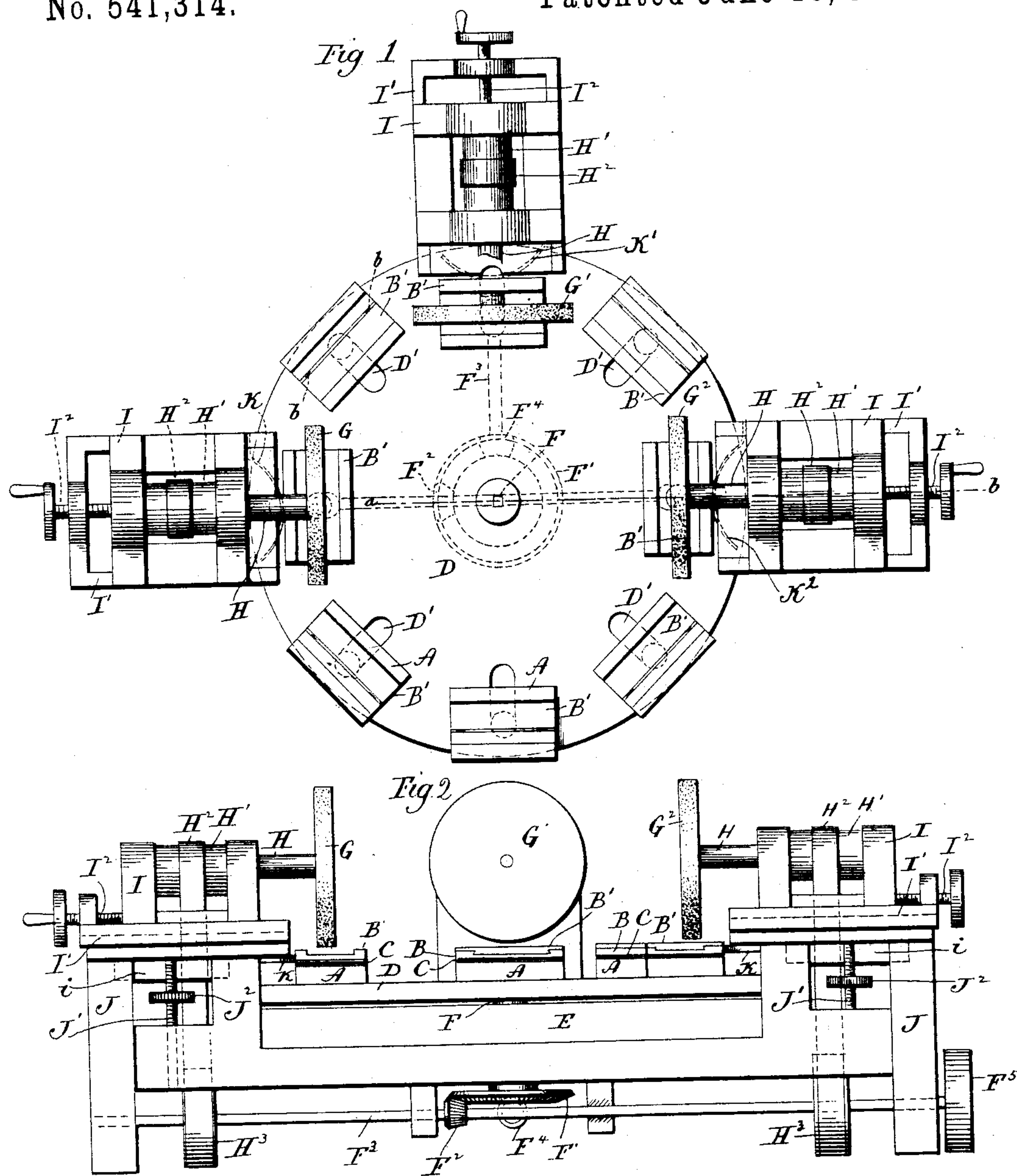


2 Sheets—Sheet 1.

No. 541,314.

Patented June 18, 1895.



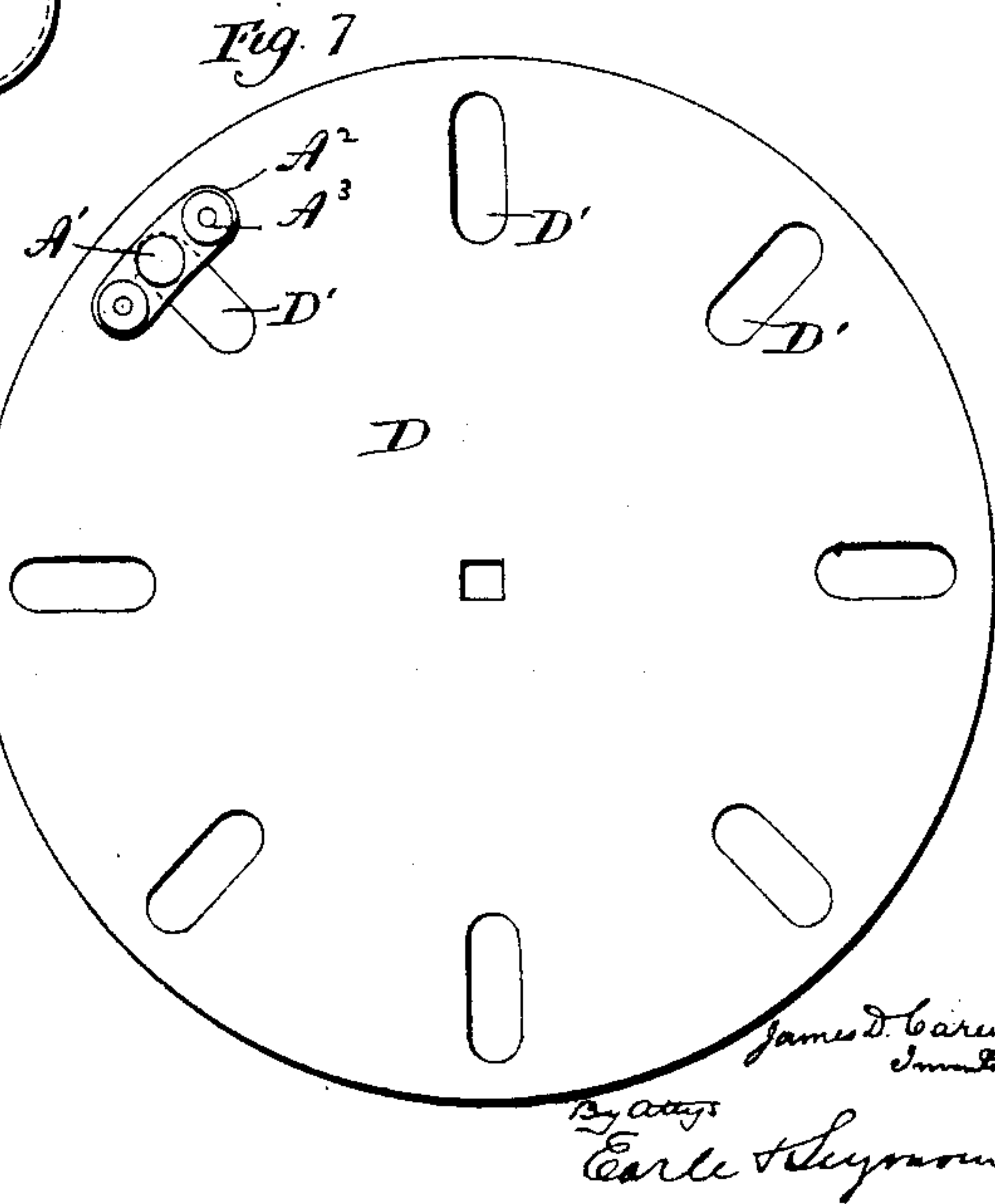
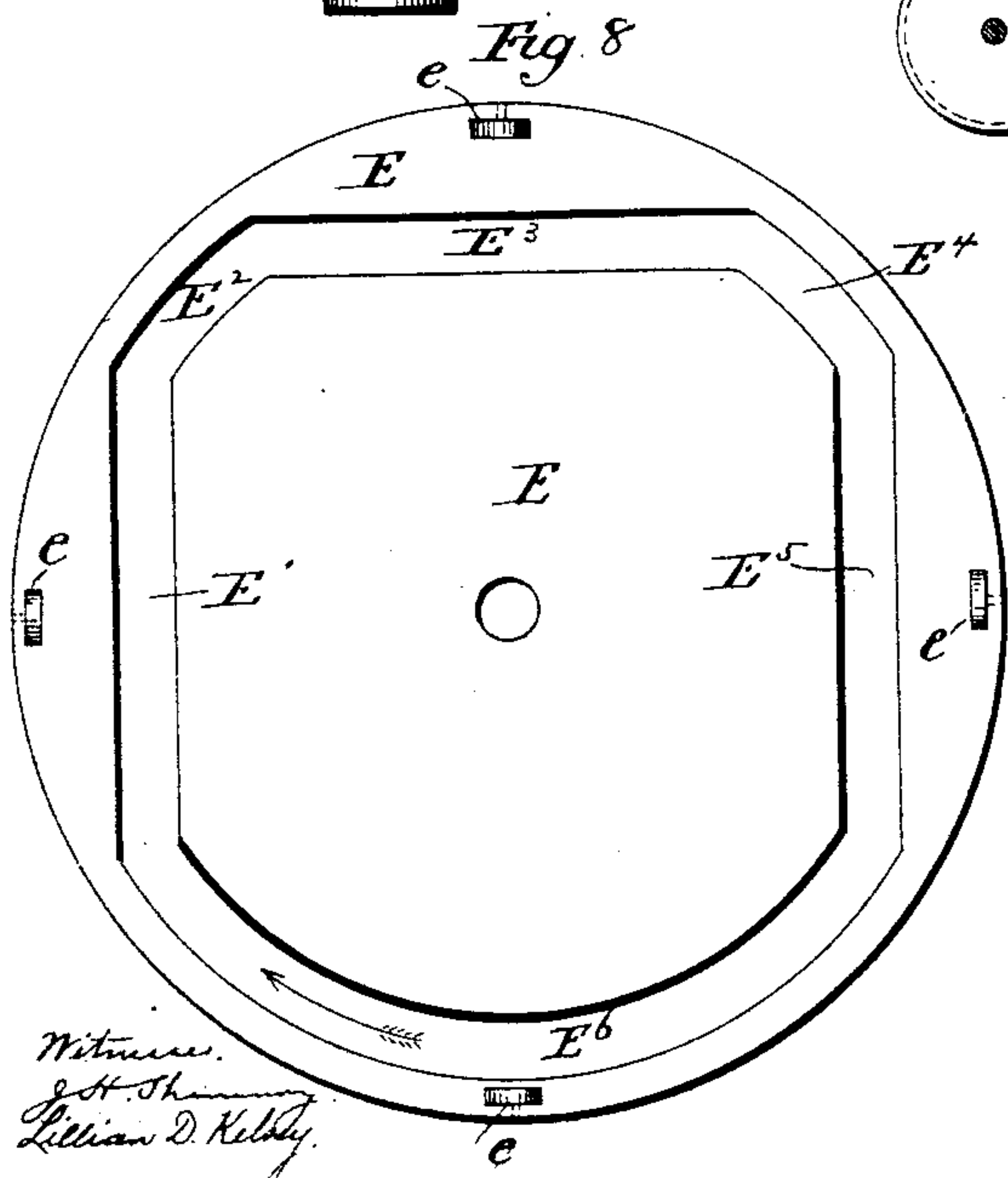
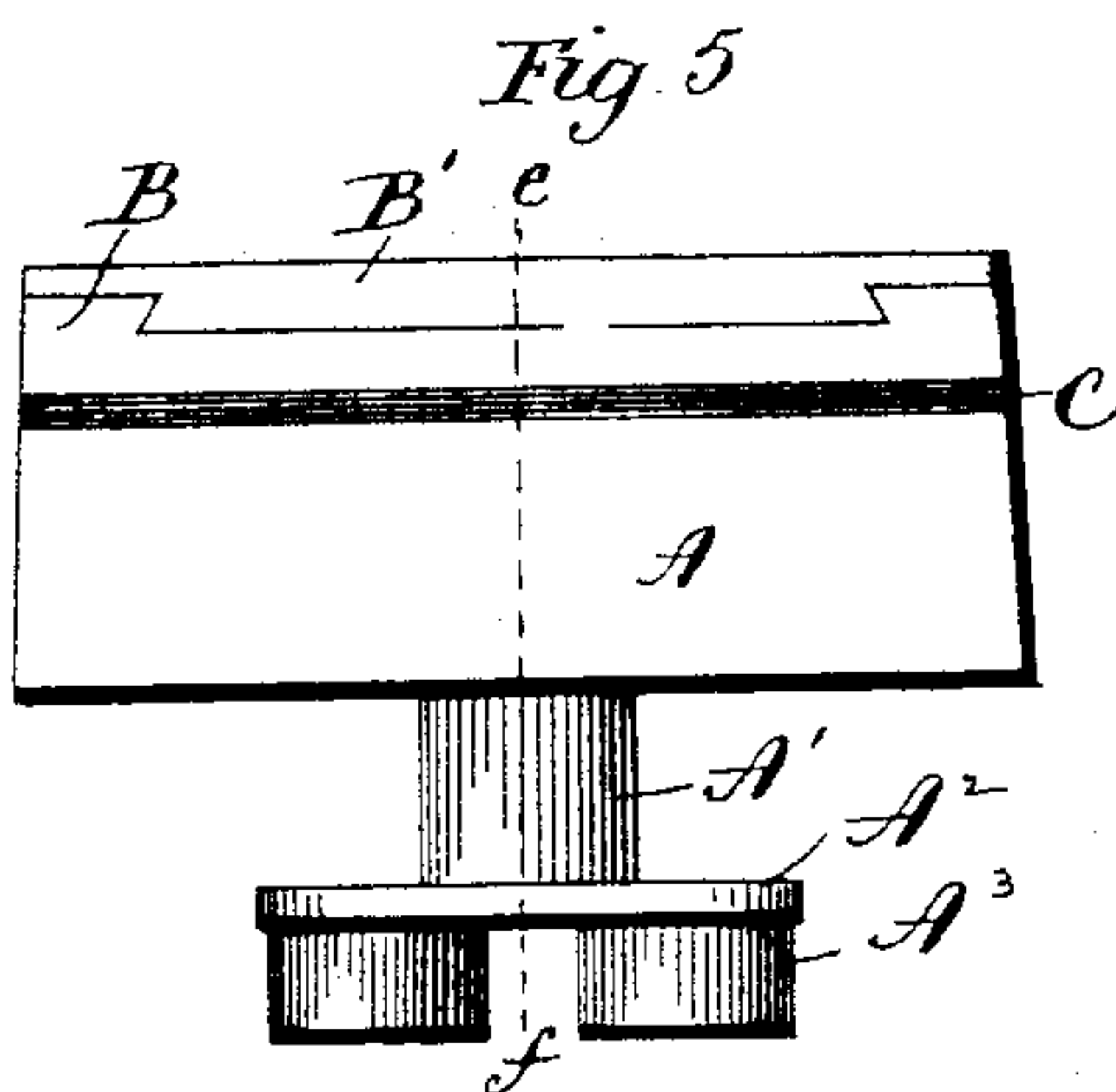
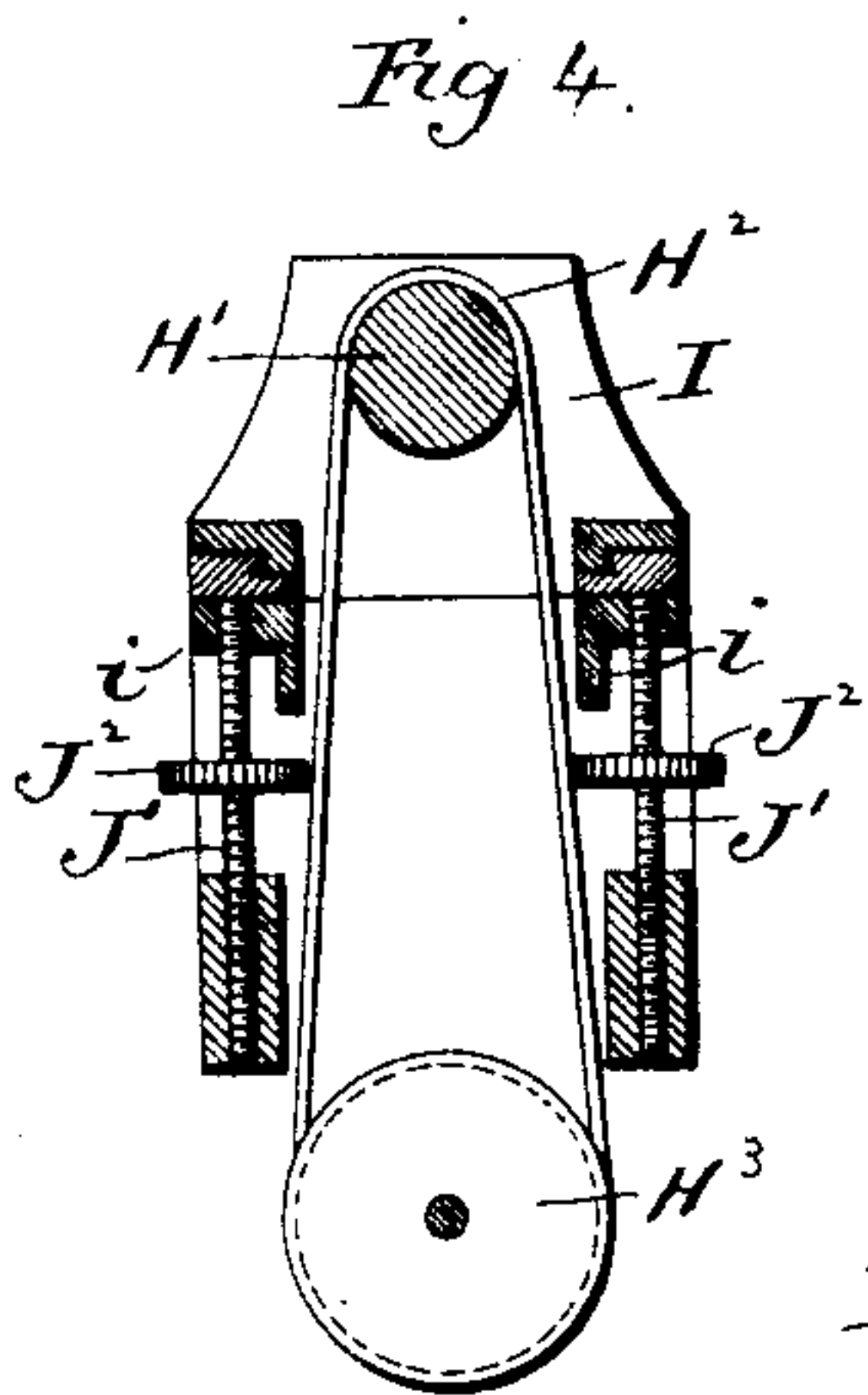
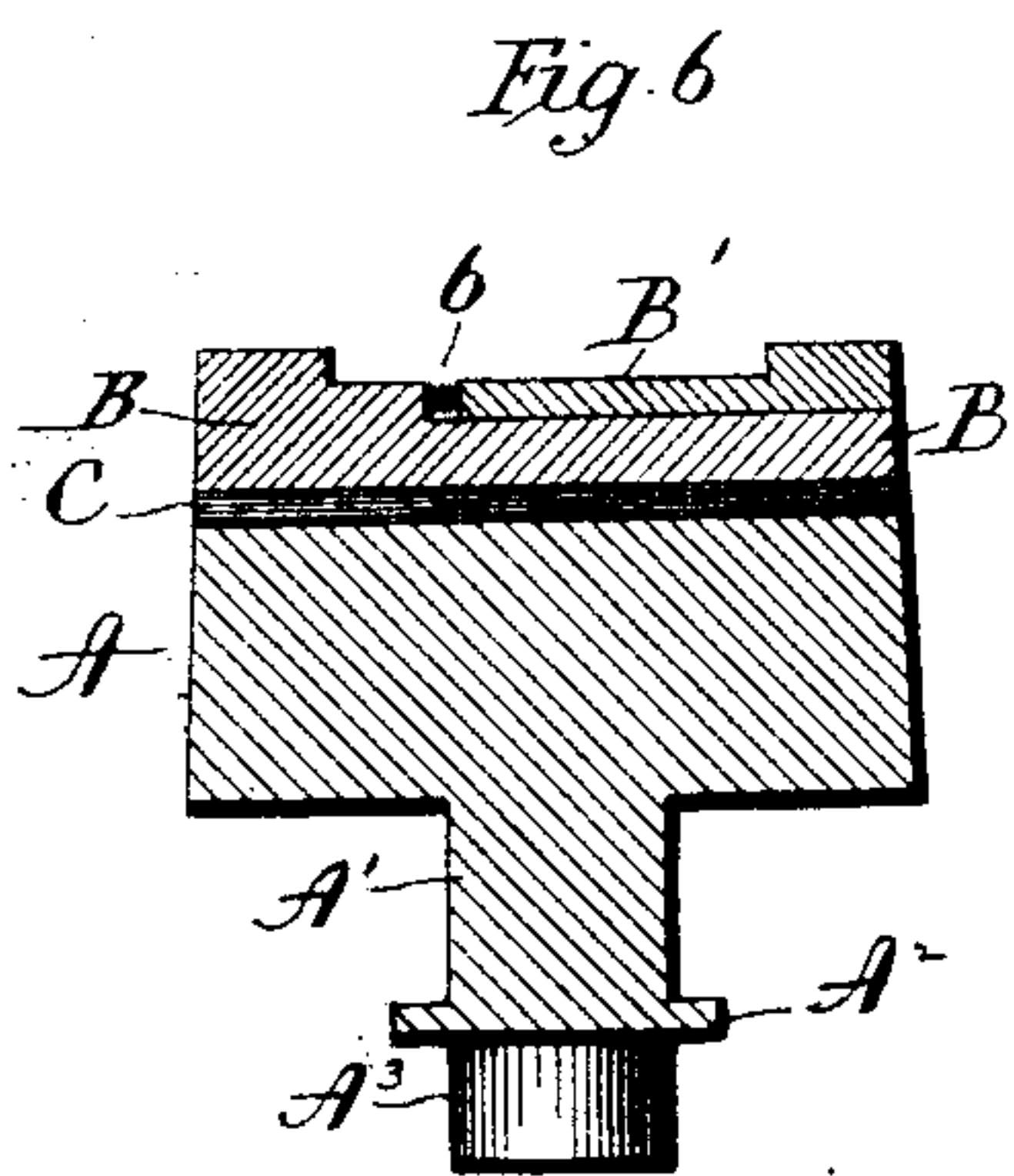
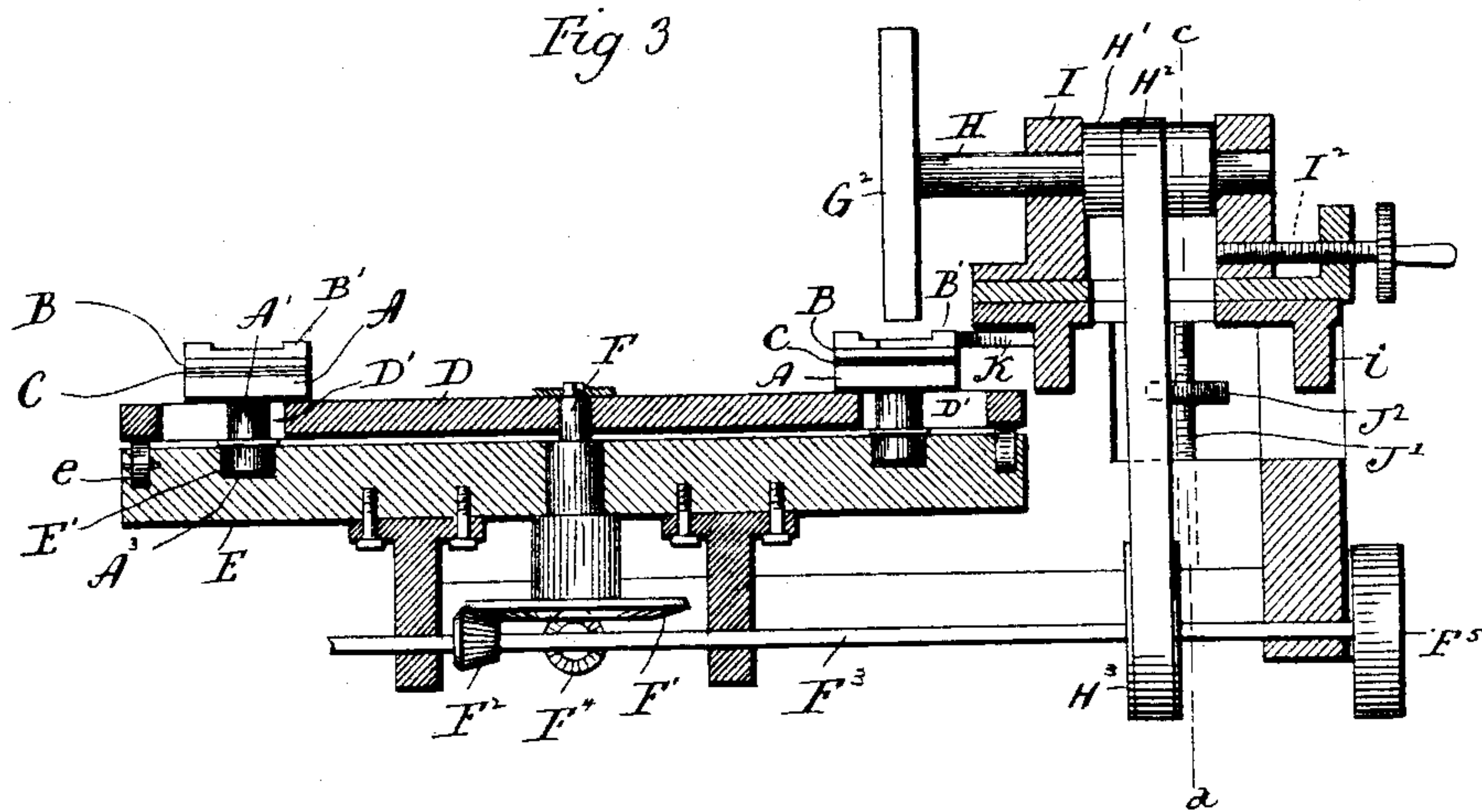
Witnesses
J. H. Shumway
Lillian D. Kellogg

James V. Carey,
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2 Sheets—Sheet 2.

No. 541,314.

Patented June 18, 1895.



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UNITED STATES PATENT OFFICE.

JAMES D. CAREY, OF BRANFORD, CONNECTICUT, ASSIGNOR OF ONE-HALF
TO WILLIAM E. BAILEY, OF SAME PLACE.

POLISHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 541,314, dated June 18, 1895.

Application filed November 19, 1894. Serial No. 529,253. (No model.)

To all whom it may concern:

Be it known that I, JAMES D. CAREY, of Branford, in the county of New Haven and State of Connecticut, have invented a new
5 Improvement in Polishing-Machines; 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
10 the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a plan view of one form which a polishing-machine constructed in accordance with my invention may assume; Fig. 2, a view
15 thereof in front elevation; Fig. 3, a view of the machine in vertical section on the line *ab* of Fig. 1; Fig. 4, a view on the line *cd* of Fig. 3; Fig. 5, a detached view in side elevation of one form of movable blocks, together
20 with the cushion, work-holder, depending post, and shoes; Fig. 6, a view on the line *ef* of Fig. 5; Fig. 7, a detached plan view of the dial; Fig. 8, a similar view of the stationary bed containing the operating-groove.

25 My invention relates to an improved polishing machine, designed with particular reference to polishing the leaves of hinges, escutcheons and other small articles of similar character, but also adapted to be used in pol-
30 ishing much larger articles if desired, the object of my invention being to produce a simple, convenient and effective machine, having a wide range of adjustment and adaptation, and in which the articles are automatically
35 presented to the several polishing-wheels, whereby a great economy of labor is effected.

With these ends in view my invention consists in a polishing-machine having certain details of construction and combinations of
40 parts, as will be hereinafter described, and pointed out in the claims.

As herein shown and described, the machine is provided with three polishing-wheels, but that number may be varied, as required
45 by the character of the work to be done. The said machine employs a series of small blocks A, each of which is provided with a two-part holder, consisting, as herein shown, of a fixed, grooved clamping-plate B, and a movable
50 clamping-plate B', dovetailed into the plate B, and normally held in its open position by

means of one or more springs *b* interposed between the two plates. Between the holder and the upper face of the block, I by preference locate a rubber cushion C, which is firmly
55 secured to the block, and permits the holder to yield in something the same manner that the hand yields in hand-polishing. The holder itself will vary in form and construction, according to the character of the work to be
60 done, my design being that each machine shall be provided with a series of holders adapted to be interchangeably applied to the small blocks, as required. The said blocks are
65 mounted upon and rotated with, a horizontally revolving dial D, which is supported upon four small anti-friction rollers *e*, mounted in and standing slightly above the face of a circular stationary bed E. Each of the blocks A is
70 provided with a downwardly projecting post or stem A', furnished at its lower end with a shoe, consisting, as shown, of a horizontally arranged plate A², and two anti-friction rollers A³ A³, applied to the lower face thereof. I do
75 not limit myself, however, to constructing the shoe as described. For the clearance of the posts A' of the respective blocks, the revolving dial is armed with radially arranged elongated
80 slots D', of which there is one for each block. The shoes of the blocks travel in an operating groove, adapted to receive them, and formed in the upper face of the bed E, the said groove
85 having straight portions E', E³ and F⁵, and curved portions E², E⁴ and E⁶. The said groove I term the operating groove, because it shapes the course of the blocks as the dial rotates.
90 The dial is rotated by means of a vertically arranged spindle F, passing centrally upward through it, and also centrally upward through the bed E, and furnished at its lower end with a beveled wheel F', which is meshed into
95 by a bevel-pinion F², mounted upon the driving-shaft F³, which is furnished with a driving-pulley F⁵, to which power is communicated in any convenient manner. As the dial
100 revolves, the shoes of the blocks travel along in the operating-groove, the straight portions E', E³ and F⁵ of which compel the blocks to travel in a straight line under the polishing-wheels G, G' and G², which, we will say, are
coarse, medium, and fine. These wheels are mounted upon the inner ends of horizontally

arranged spindles H, journaled at their outer ends in carriages I, mounted for longitudinal movement upon beds I' which in turn are mounted so as to be vertically adjusted in the frame J of the machine. The spindles of the wheels G and G² are each provided with a long drum H', over which run belts H² H² also running over pulleys H³ H³, mounted upon the main shaft F².

Adjusting-screws I², connected at their inner ends with the respective carriages I, are mounted in the outer ends of the movable beds I', for moving the carriages longitudinally thereon. Vertically arranged adjusting-screws J', carrying hand-wheels J² are mounted in the frame of the machine, so as to impinge at their upper ends against the under faces of the opposite edges of the beds I', whereby the same may be vertically adjusted, as required, to accommodate wheels varying in diameter, owing to variations in the thickness of their polishing surfaces or to variations in the sizes of their bodies. In order to guide the beds I' in being raised and lowered, as described, each is provided with a depending box-like, rectangular frame i, through which the belt H² passes. The wheels G and G² are driven directly from the main-shaft, but the wheel G' is driven from a shaft F³, furnished at its forward end with a pinion F⁴, which meshes into the bevel-wheel F'. For co-operation with the movable clamping plates of the holders shown herein, I employ three corresponding springs K, attached to the machine-frame near the edges of the dial, and under the several wheel-carrying spindles.

Having now described the construction of one form which a polishing machine constructed in accordance with my invention may assume, I will proceed to describe its operation.

The attendant standing in front of the machine, applies escutcheons, let us say, to the holders of the several blocks as they are brought around to the front of the machine by the revolution of the dial. Then when the shoe of a block enters the outer end of the straight portion E' of the operating groove, the shoe will be forced to move in a straight path, causing the block to turn into the plane of the wheel G, and pass under the same in a perfectly straight line, during which time the exposed surface of the escutcheon will be polished by the said wheel, which, it will be understood, is being rotated in an opposite direction from that in which the block is moving. I may here remark that just before the block passes under the wheel, its movable clamping-plate B' is engaged with the spring K, secured to the frame J of the machine, under the spindle of the wheel G. This spring acts upon the outer edge of the movable clamping-plate B' of the holder of the block, so as to force the same inward, and cause it to firmly grip and hold the escutcheon in place, whereby the escutcheon is automatically gripped, and firmly held during the pol-

ishing operation, but the articles polished may be firmly secured in their holders at the time they are inserted therein by the attendant, if desired, though I conceive it to be the better plan to cause the machine to grip the articles itself as described, when they are being polished. From the inner end of the straight portion E' of the groove, the shoe of the block enters into the curved portion E² thereof, in which the shoe turns so as to turn the block into position to cause it to readily enter the adjacent end of the straight portion E³ of the groove, the said portion standing at a right angle to the straight portion E' already mentioned. The said portion E³ of the groove causes the block, through the medium of its shoe, to move in a perfectly straight line under the polishing-wheel G', which also revolves in an opposite direction from the direction in which the escutcheon is moved. The spring K' corresponding to the spring K located under the spindle of the wheel G', now acts upon the clamping-plate of the holder to grip the work while passing under the said wheel. The shoe of the said block then enters the curved portion E⁴ of the groove, which causes the shoe, and hence the block, to turn into position to enter the straight portion E⁵ of the groove, the said portion E⁵ being at a right angle with the portion E³ thereof, but parallel with the portion E' thereof. The said portion E⁵ of the groove acts upon the block through the medium of its shoe, to cause the escutcheon to be passed in a straight line under the final polishing-wheel G², which is finer than either the wheel G' or G. The spring K² under the spindle of the wheel G², again engages with the movable clamping-plate B', and causes the work to be gripped and held while passing under the said wheel. From the straight portion E⁵ of the groove, the slide enters the long curved portion E⁶ thereof, and is again brought around to the attendant, who removes the polished escutcheon, and replaces it with another, and so on. It will thus be understood that the machine automatically presents the articles to the several wheels employed for polishing.

It will be readily understood, also, that by means of my improved machine, a great economy of labor is effected, inasmuch as one person can attend to one machine containing several polishing wheels. The rate at which the dial is revolved with reference to the rotation of the polishing wheels, will be varied according to the character of the work being done, but of course the wheels will rotate very rapidly, while the dial will be rotated very slowly.

It is clear in carrying out my invention that some changes in the construction shown and described may be made, and I would therefore have it understood that I do not limit myself to the exact form represented, but hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

Having fully described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. In an automatic polishing machine, the combination with a stationary bed containing an operating groove, comprising straight and curved portions, of a rotating dial located directly above the said bed, small blocks carried by the dial, and having depending posts carrying shoes, which travel in the groove of the bed; and polishing wheels arranged to rotate in line with the straight portions of the groove, substantially as set forth, and whereby the blocks are caused to move in a straight line by the straight portions of the grooves, under the respective wheels.

2. In an automatic polishing machine, the combination with a stationary, horizontal bed constructed with a groove formed in its upper face, and comprising straight and curved portions; of polishing wheels respectively extending inward over the edge of the bed above the straight portions of the groove, work-carrying blocks provided with posts entering the said groove, which gives special direction to the movement of the blocks, and means for moving the blocks to cause the posts to make the circuit of the said groove, substantially as described.

3. In a polishing machine, the combination with a stationary horizontal bed, constructed with a groove formed in its upper face and comprising straight and curved portions, of a revolving dial located above the said bed in the plane thereof; small movable blocks mounted upon the dial and provided with depending shoes located in the groove of the bed and traveling therein; polishing wheels also located above the dial and arranged in line with the straight portions of the said groove, and means for adjusting the said wheels vertically and laterally and for driving them, substantially as set forth.

4. In a polishing machine, the combination with a stationary, horizontal bed constructed with a groove formed in its upper face, and comprising straight and curved portions; of a revolving dial located above the said bed and in the plane thereof, work-holding blocks mounted upon the dial, and provided with depending posts entering the said groove in the bed, and, as the dial revolves, making the circuit of the groove which gives special direction to the movement of the blocks, holders carried by the blocks for gripping the work, cushions located between the said holders and the bearing of the blocks upon the

dial, and polishing wheels extending inward over the straight portions of the groove in the dial, substantially as set forth.

5. In an automatic polishing machine, the combination with a movable block, of a work-holder carried thereby, and means fixed to the frame of the machine for acting upon the work-holder so as to cause the same to grip the work while the same is being polished, substantially as described.

6. In an automatic polishing machine, the combination with a movable block, of a work-holder applied thereto and comprising a movable clamping-plate, and a spring connected with the machine frame in position to engage with the said plate for closing the same to grip the work preparatory to the subjection of the work to polishing action, substantially as described.

7. In a polishing machine, the combination with a stationary bed, having a groove comprising straight and curved portions formed in its upper face, of a dial located directly over the said bed in the plane thereof, and constructed with clearance slots, small movable blocks supported upon the said dial and provided with depending posts passing through the said slots therein, and furnished at their lower ends with shoes entering the groove in the said bed and comprising anti-friction rollers which engage with the side walls of the groove and turn the blocks to cause them to follow the course thereof, substantially as set forth, and whereby the blocks are caused to move in a straight line by the straight portions of the grooves.

8. In a polishing machine, the combination with a polishing wheel, of a horizontally arranged spindle for carrying the said wheel, a carriage in which the spindle is mounted, a vertically adjustable bed on which the carriage is longitudinally movable, and which is constructed with a depending, box-like, rectangular frame through which the belt passes upward to the spindle, and means engaging with the opposite edges of the said bed for adjusting the same vertically, substantially as set forth.

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

JAMES D. CAREY.

Witnesses:

FRED. C. EARLE,
LILLIAN D. KELSEY.