

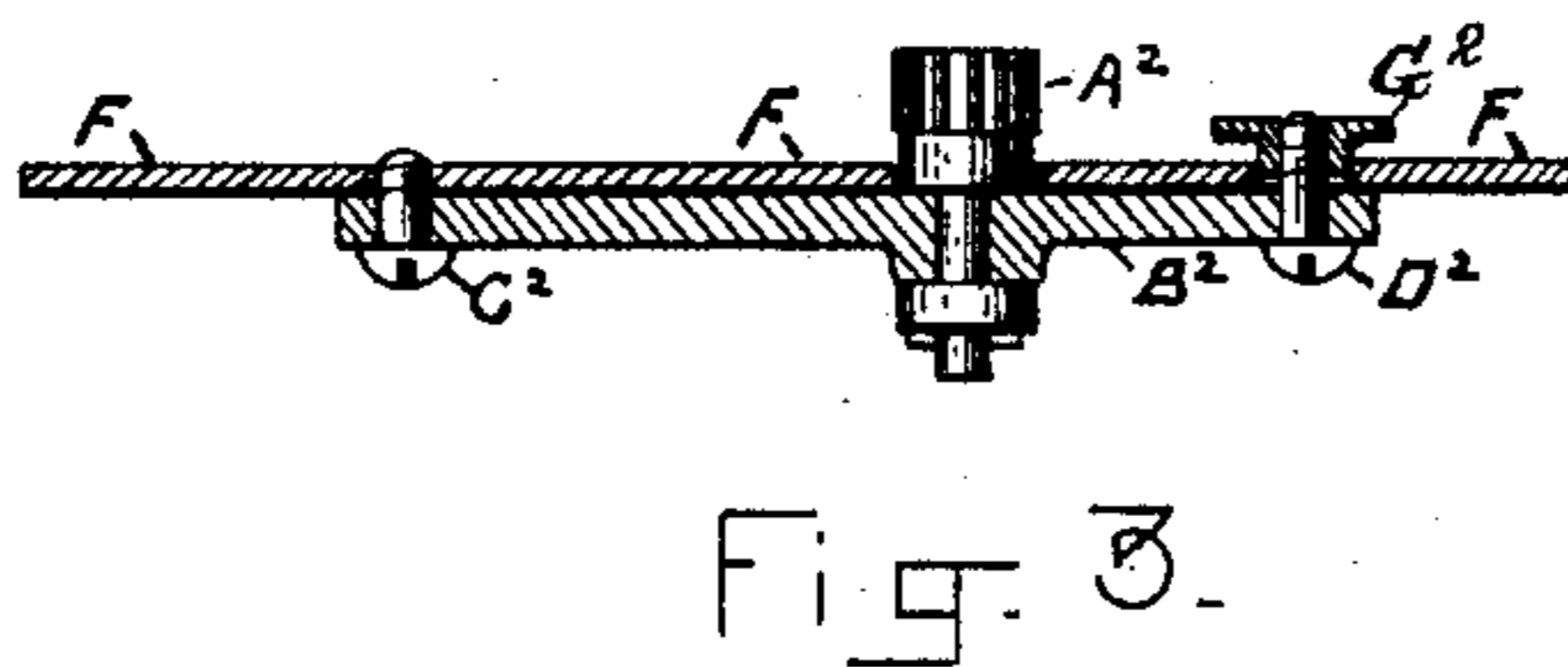
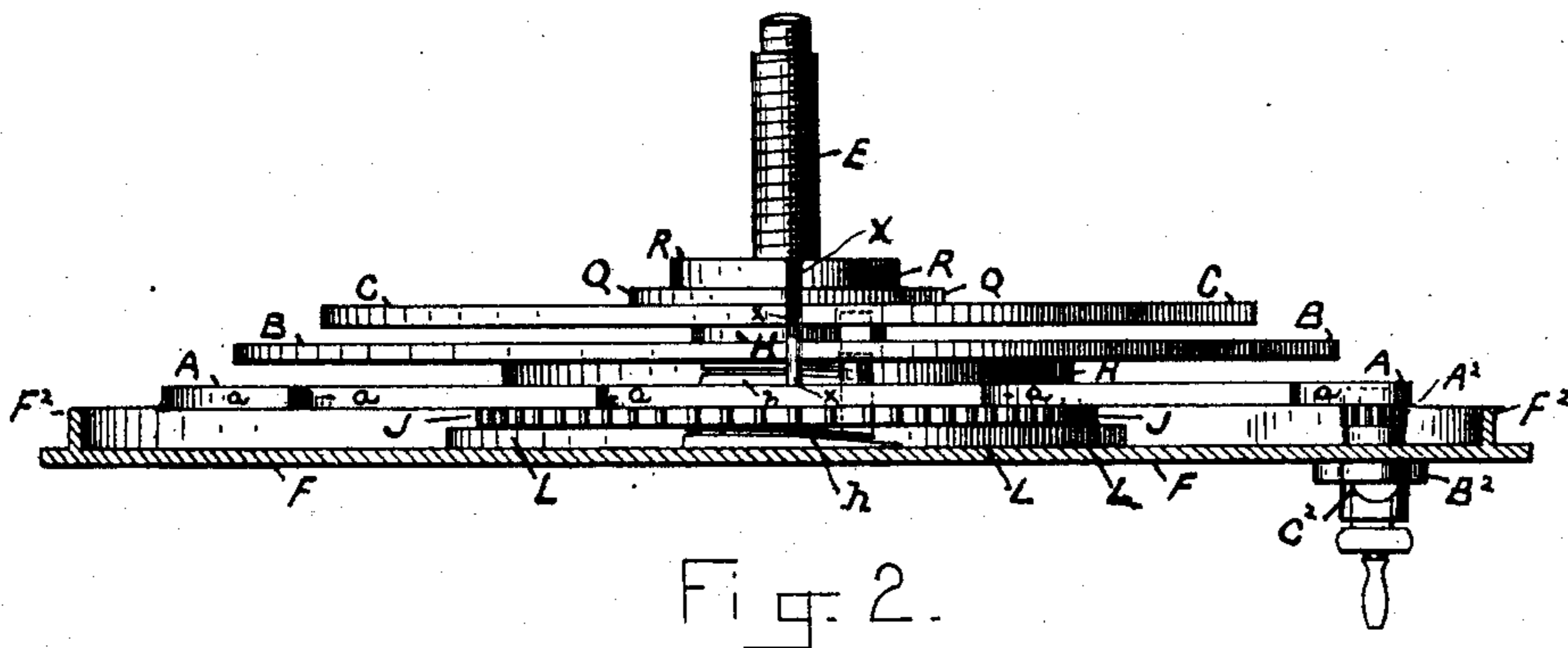
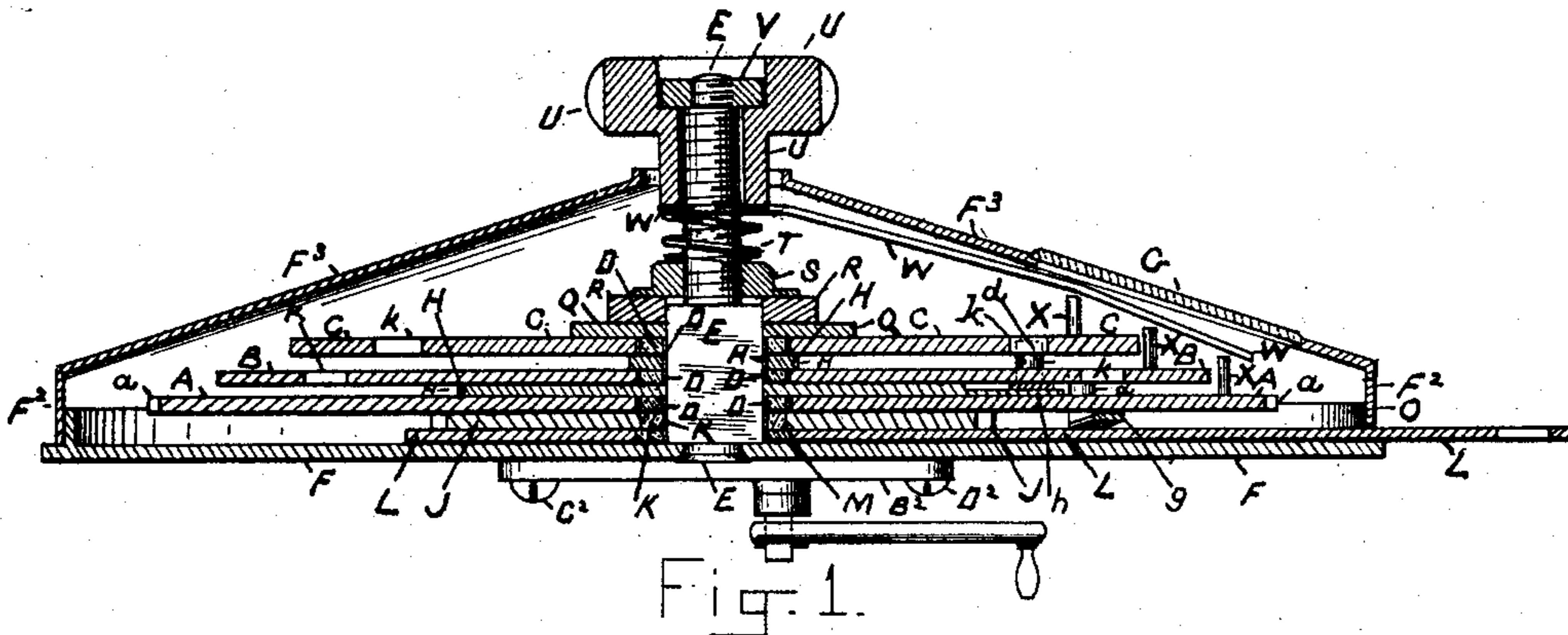
(No Model.)

2 Sheets—Sheet 1.

A. BERRENBURG.
REGISTERING APPARATUS.

No. 369,092.

Patented Aug. 30, 1887.



WITNESSES:
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Francis M. Brown.

INVENTOR:
Adolph Berrenberg
by his Attorneys
Brown Bros.

(No Model.)

2 Sheets—Sheet 2.

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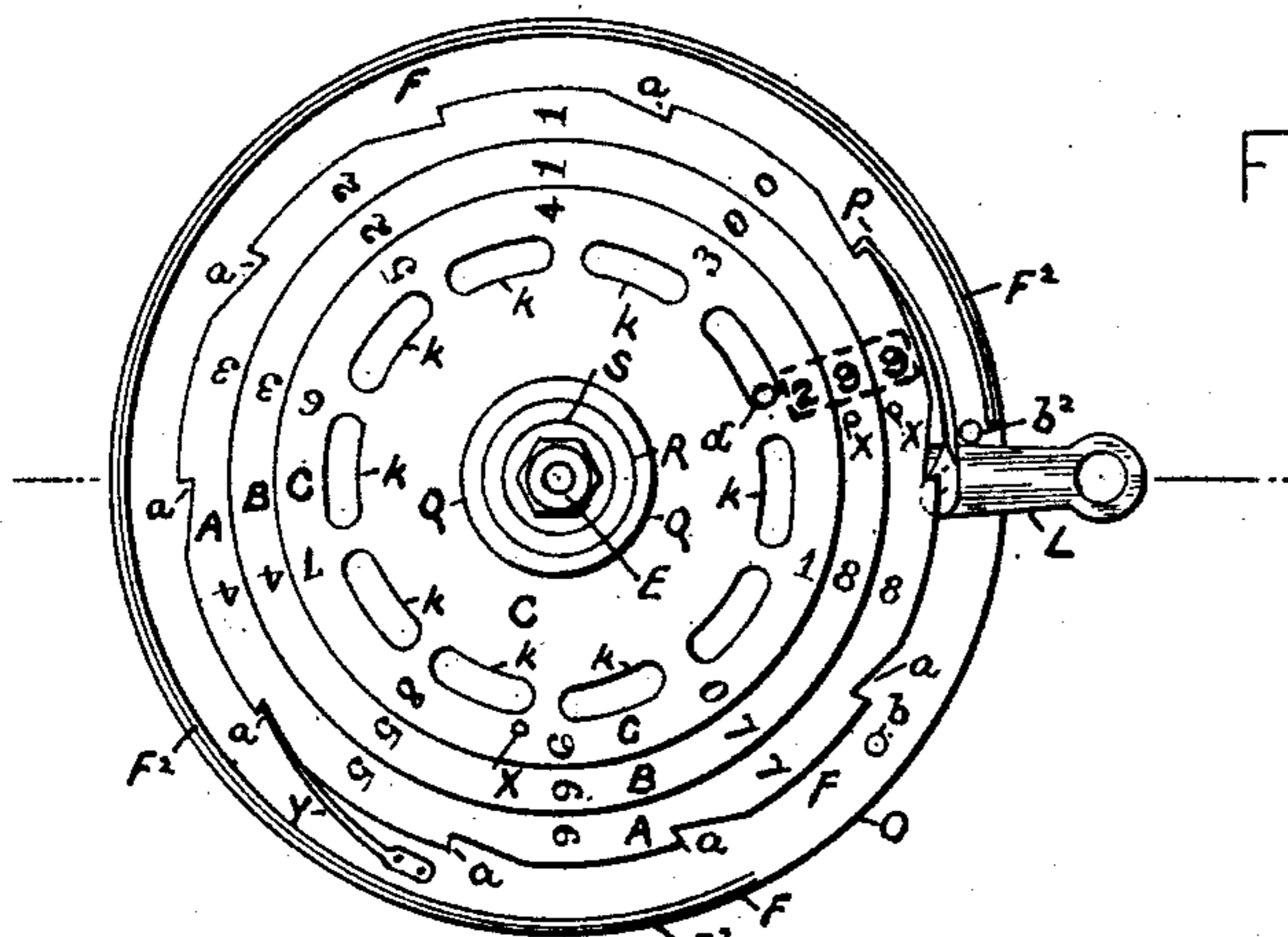


Fig. 4.

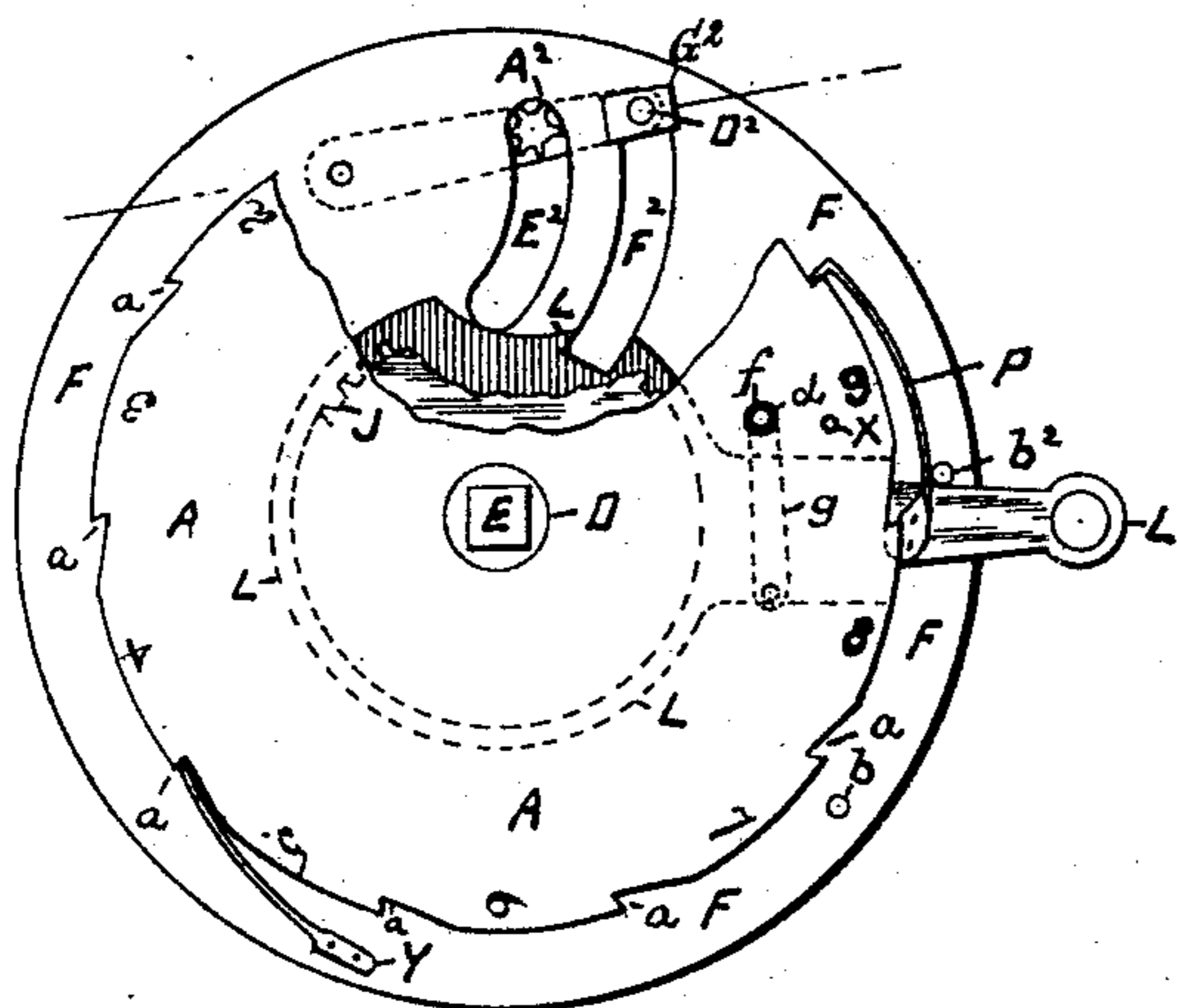


Fig. 7.

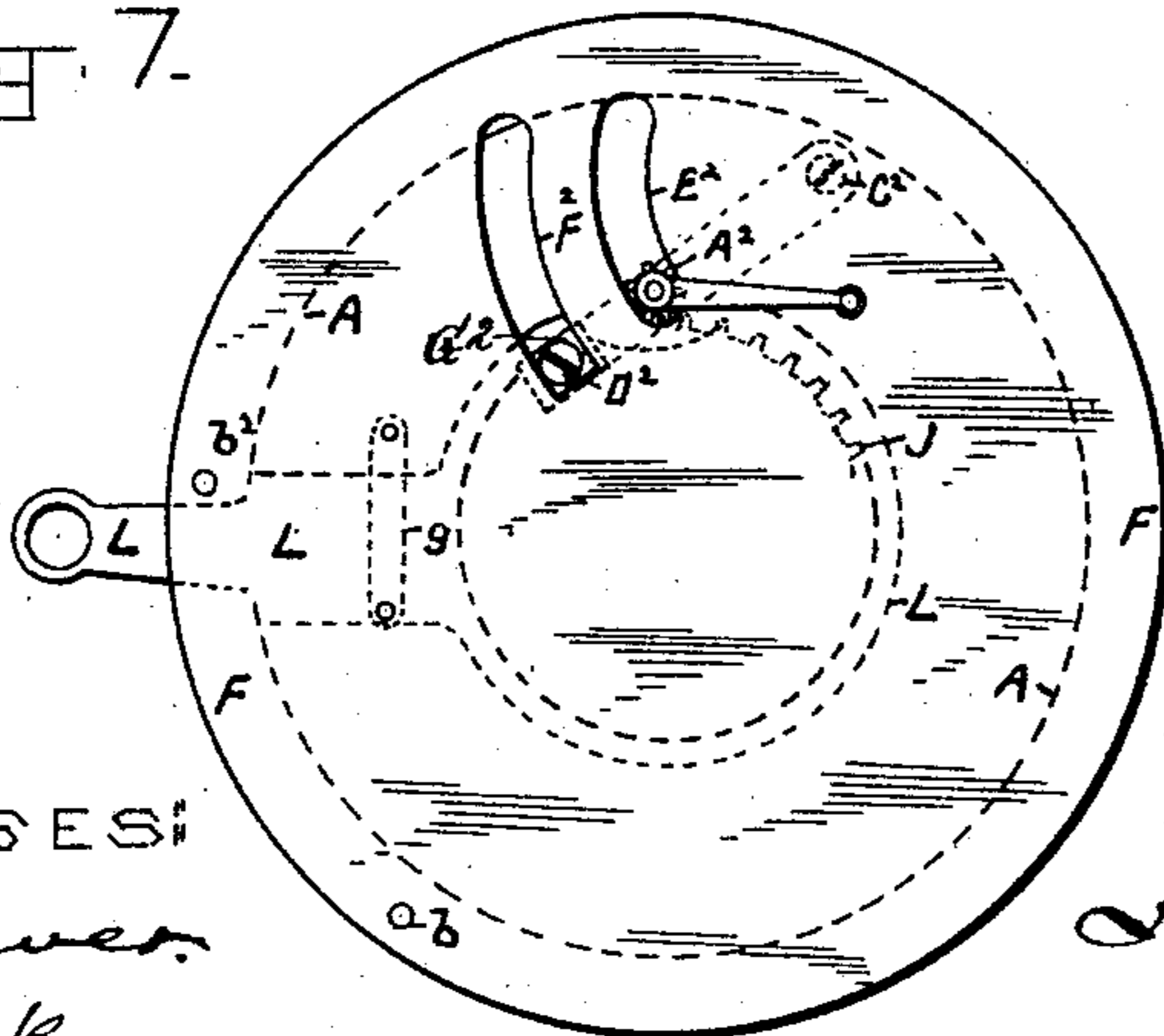


Fig. 8.

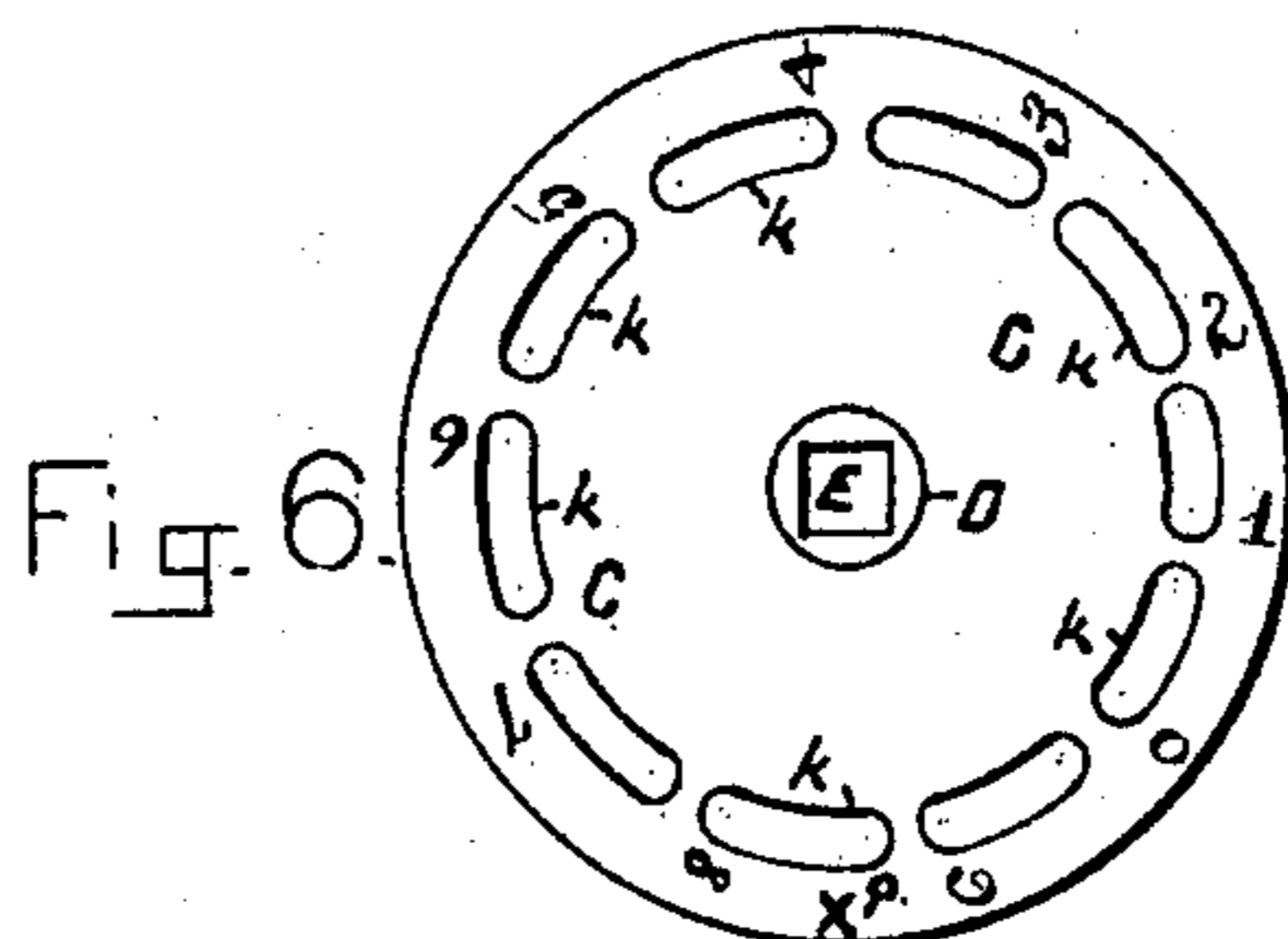


Fig. 6.

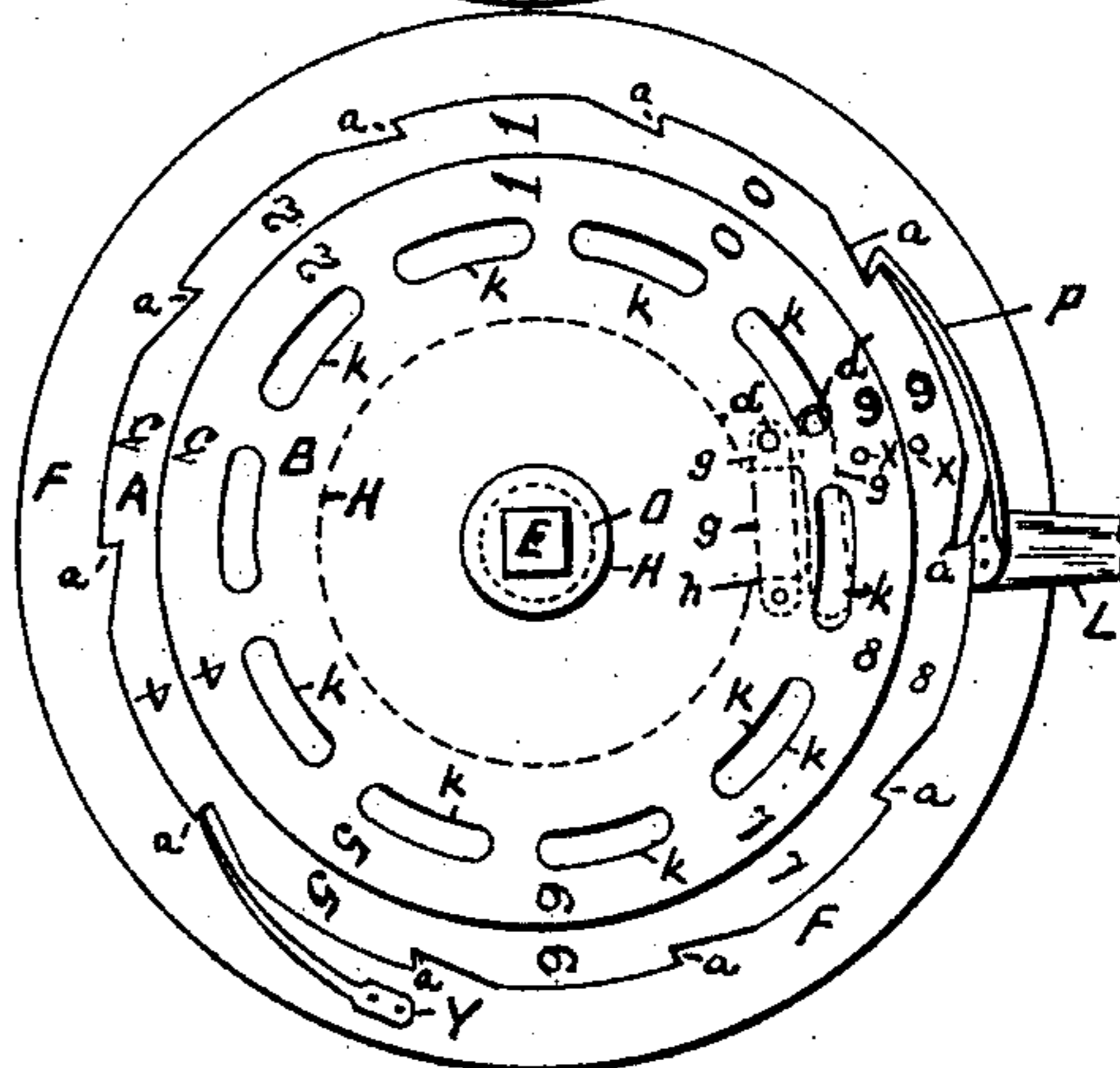


Fig. 5.

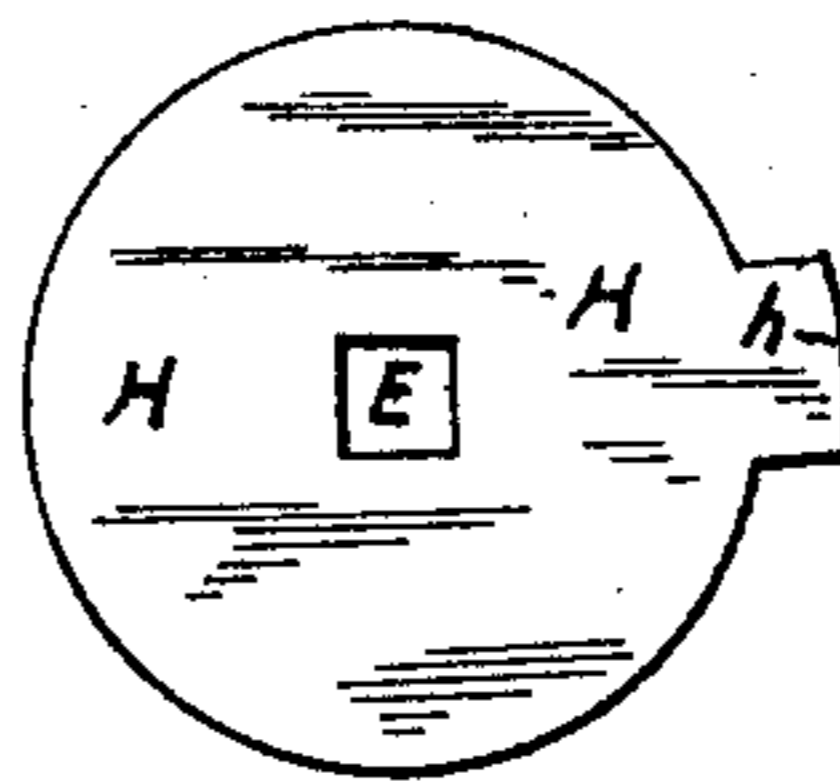


Fig. 9.

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UNITED STATES PATENT OFFICE.

ADOLPH BERRENBURG, OF BOSTON, MASSACHUSETTS.

REGISTERING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 369,092, dated August 30, 1887.

Application filed May 4, 1886. Serial No. 201,073. (No model.)

To all whom it may concern:

Be it known that I, ADOLPH BERRENBURG, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Registering Apparatus, of which the following is a full, clear, and exact description.

The registering apparatus of this invention has a series (more or less in number, but at least two) of disks arranged to be rotated about a common axis, and they are severally placed alongside of and parallel with, but held separate from, each other. Each disk, on one side, is marked at equal distances apart and in regular succession, and in the same direction, with the digits 0 to 9, and the several disks are incased and of such relative diameters and their digits are so placed that a digit of the series of disks, by proper rotation of the disks, can be brought into a given radial line of the common axis of rotation of the disks and there exposed to view, the several digits being preferably at equal distances apart. In the practical use of the several so-figured disks, arranged together as stated, the disk the larger in diameter represents units, the next smaller tens, the next smaller hundreds, and so on through the whole series, and the disk of units, by means of mechanism forming a part of this invention, is rotated so as to bring its digits one after the other into said given line. This mechanism is such as to be readily adapted to be operated either by and from a reciprocating or from a continuously-rotating device, according as either one or the other is put into connection therewith, and all otherwise substantially as hereinafter described. The moving of the disk of units to expose its digit 0 at said given place moves at the same time the disk of tens and brings the digit of its series of digits then next in order in a line coincident with the zero-digit of the disk of units, and then there leaving it, the disk of units, if continued in its movement, exposes its digits, one after another, at said given place, and on its movement to again bring its digit 0 thereto it again carries forward the disk of tens and places its digit next in order at said place and there leaves it, and so on until digit 9 of said disk of tens has been brought thereto, when on the next move of the disk of tens the disk of hundreds is moved

forward, bringing the digit of its series of digits then next in order thereto and there leaving it, and the movement of the disks of units and tens then goes on as before until the zero-digit of the disk of tens is the next in order, on which the disk of hundreds is moved forward with it, carrying, of its series of digits, the digit then next in order, and so on, and substantially as in registering or counting apparatus of other and well-known constructions, and which use a series of disks marked with the digits in regular order.

This invention consists in certain novel features of construction and arrangement of mechanism for the class of registering apparatus above described, and all substantially as hereinafter fully described and shown in the drawings.

In the accompanying plate of drawings the registering apparatus of this invention is illustrated as composed of three disks, each marked with the digits 0 to 9.

Figure 1 is a central section through the series of disks marked with digits, the operating mechanism therefor, and the casing for the whole. Fig. 2 is an edge view with the casing in part removed. Fig. 3 is a sectional view in detail, hereinafter referred to. Figs. 4, 5, 6, and 7 are face views of the disks marked with digits, and as will hereinafter appear. Fig. 8 is a face view of the casing at its rear side or side opposite to that at which the digits of the disks are to be displayed, and Fig. 9 is a view in detail. Figs. 4, 5, 6, 7, 8, and 9 are all on a scale reduced from that of Figs. 1, 2, and 3, which are on the same scale.

In the drawings, A, B, and C are three disks, each marked on one side and near its edge or periphery with the digits 0 to 9 in regular order and as to each disk at equal distances apart, varying, however, in the different disks. The numbered disks A B C are of different diameters and placed concentrically upon each other, and their numbering is arranged so that the several digits of each disk are exposed to view, Fig. 4. Each disk at its center receives a loosely-fitting bushing-ring, D, concentrically placed upon a stationary square post or arbor, E, at the center of a circular plate, F, making one part of the casing for the mechanism of this apparatus. This casing in its other parts consists of a vertical rim, F², around

plate F, and a conical-shaped top plate, F³, having a central opening at its apex, and a radially-located glass plate, G, at which to expose to view in the operation of the apparatus, as hereinafter described, a radial line of the digits of the disks, all the other digits being concealed from view by the conical top. The disks A B C, with their bushing-rings D on the arbor or post E, are separated from each other by a collar, H, fitting said post. The disk A (the larger in diameter, and the disk of units) is the nearer to, and the disk C (the disk of hundreds, the smaller in diameter) is the farther from the casing-plate F, and the disk B (the disk of tens, and which is of a diameter less than the disk A of units and greater than the disk C of hundreds) is between the disks A C.

The disk A of units is the lower of the disks, and it carries a gear-wheel, J, turning upon a bushing, K, fitting the center post, E, and in turn resting upon a flat plate or arm, L, which rests upon the casing-plate F and turns upon a bushing, M, fitting about the center post. The arm L projects through a slot, O, in the casing-rim F², and carries a spring-pawl, P, to engage with the ratchet-teeth *a* of the disk A of units, the ratchet-teeth being at equal distances apart and half-way between the digits of said disk.

Q is a collar on post E above the disk C of hundreds, and R is a rubber disk on the collar and confined by a screw-nut, S, screwed upon the post and confining the several disks A B C, separating-collars H, gear-wheel J, and arm L, carrying pawl P, in position, but with a pressure sufficiently yielding to allow said disks, gear-wheel, and pawl-arm L to be rotated on their bushing-rings, located upon the common post, E, therefor.

T is a coil spring on post E above and resting on the screw-nut S.

U is a milled button-head on the post E, passing loosely through the central opening at the apex of the conical casing-top F³, and resting upon the spring T and confined on the post by a screw-nut, V. This button-head U is free to turn and to be moved in and out through the central opening of the casing-top F³, and below this top it has a radial finger, W, and each numbered disks A B C has a vertical stud or pin, X, and all are so arranged that, with the button-head pressed inward, its finger W is placed in the horizontal plane of said studs X, and, being there held, then turning the button-head, its finger W will abut against the sides of the studs of the disks and carry the disks with it, thus enabling the several zero-digits of the disks to be placed in one radial line and at the radial glass plate G of the casing-top F³, or, in other words, to be set to zero. On a release of the pressure on the button-head U, the coil-spring T returning to its normal position, as also its finger W, the latter is placed out of the horizontal plane of the studs X of the numbered disks.

The arm L, carrying the spring-pawl P, re-

ciprocated about the axis of the arbor E, (its reciprocation in either direction being limited by stop-pins *b b*² of the bottom casing-plate, F,) acts through said pawl and the ratchet-teeth *a* of the disk A of units to intermittently rotate said disk A, and thus the digits of said disk are brought one after another to and exposed to view at the glass plate G.

Y is a spring-pawl engaging the ratchet-teeth *a* of the disk A and holding said disk against accidental disturbance on the backward reciprocation of the spring-pawl P. Ten intermittent movements of the disk of units, above described, completes one rotation of it, and in its movement to bring its digit 0 to the glass G it carries with it the disk B of tens, and brings the digit the next in order of its series of digits to said glass, and there leaves it until the disk of units again is moved to bring its zero-digit to said glass, when the disk B of tens is again carried with it, bringing the digit the next in order of its series of digits to said glass, and there leaving it, and so on until the digit 0 of the digits of the disk of tens is the digit next in order to be brought by the movement of the disk of units to the glass, when the disk of tens carries with it the disk of hundreds and brings the digit of its series of digits the next in order to the glass G, and so on through the disk of hundreds the same as described for the disk of tens, and through any series of disks similarly arranged and constructed, as will be hereinafter described—as, for instance, a disk of thousands, tens of thousands, hundreds of thousands, &c.

For intermittently moving one of the disks from the rotation of another, as above described, each disk to be so operated has a vertical stud, *d*, which enters from the underside of the disk a hole, *f*, through the disk, and is attached at said side by a spring-arm, *g*, which under the rotation of the disk rides up an incline, *h*, concentric with the axis of rotation of the disks and suitably located therefor. This incline *h* for the stud *d* and its spring-arm of the disk A is a part of the pawl-carrying arm L, and for the disk B it is a part of the collar H, separating said disk B from disk A, and the same would be true in substance as to the disk C were a disk of thousands added thereto, and so on through a series of numbered disks whatever they may be—as, for instance, a disk of thousands, a disk of tens of thousands, &c.

Each stud by sliding up the incline *h* belonging to it is thereby pressed through a hole, *f*, of the disk which carries it, and so pressed it is entered into a slot of a series of slots, *k*, of the disk next above which is then opposite thereto, and thus this disk is locked with the disk next below and the two adapted to turn as one. The escape of each stud from the incline belonging to it breaks the lock, above described, of the disks, and the disk which was so locked with the other then remains stationary until again locked, as before, and so on.

There are ten slots in the series of slots of each disk, and the several slots have a circular direction coincident with the axis of rotation of the disks, and in each disk they are at equal distances apart, but as compared with the others these distances vary, but in all, however, such as to secure the required travel of the disks from being interlocked, as described.

The apparatus of this invention, as it is shown in the drawings, has the digits of its disks exposing 299, Fig. 4, to view at the glass G, the location of which is therein shown by dotted lines, and in this position on the next swing of the pawl P to move the disk of units to bring its digit 0 to view, that is, to the place now occupied by digit 9 of the digits of that disk, digit 0 of the disk of tens and digit 3 of the disk of hundreds are then both placed in the places now occupied by the digit 9 of the digits of the disk of tens and digit 2 of the digits of disk of hundreds, respectively, the so placing of said digits being secured from the interlock of the disk A with the disk B, and the disk B with the disk C, as has been described. Digit 0 of the disk of tens and digit 3 of the disk of hundreds having been thus placed, the interlock of the disk of units with the disk of tens and the disk of tens with the disk of hundreds is broken, and the disks of tens and hundreds then remain stationary until the disk of units is moved to again place its digit 0, then next in order, in the place occupied by its digit 9, and at the same time the disk of tens is then moved, bringing its digit 1 to the place occupied by digit 0 of said disk, and so on.

So far as explained, the operation of the apparatus described is from the reciprocation of an arm, L, working by its spring-pawl P upon the ratchet-teeth *a* of the disk A of units, and in the practical use of the apparatus this arm would be connected to the mechanism the movement of which it is desired to register.

To rotate the disk of units without the reciprocation of a pawl-carrying arm, L, and directly from a rotatory device, connection is made with the gear-wheel J of the apparatus by means of a pinion-wheel, A², arranged to be rotated from the mechanism the operations of which are to be registered. This pinion-wheel A² is carried by an arm, B², on the outside of the bottom plate, F, of the casing, and

which arm is hung on a center, C², and having a screw, D², to fasten it to the plate F. E² are circular slots in the bottom plate, F, for the passage of the projections G² of the arm B², carrying the pinion-wheel A² and the fastening-screw D² of said arm.

The pinion-wheel A², being in mesh with the gear-wheel J, is there secured by tightening up the fastening-screw D² on the arm which carries it, and, so meshed, the pawl-carrying arm L is at the limit of its return-stroke—that is, against the stop-pin *b*² therefor, and accordingly in an inoperative position.

Having thus described my invention, I claim—

1. In combination, a series of concentric disks, A B C, &c., of different diameters and severally arranged alongside of each other, and each marked off with digits 0 to 9, both inclusive, a stationary arbor, E, common to and about which said disks rotate, a concentric ratchet, *a*, of unit-disk A, a swinging arm, L, on arbor E, and carrying a spring-pawl, P, to engage said ratchet, a stop-pin, *b*, for said arm L, a gear-wheel, J, of unit-disk A, and a pinion, A², adapted to be set in or out of mesh with said gear-wheel J, all substantially as described, and for the several purposes and operations specified.

2. In combination, a series of concentric disks, A B C, &c., of different diameters and severally arranged alongside of each other and each marked off with digits 0 to 9, both inclusive, a stationary arbor, E, common to and about which said disks rotate, a pin, X, on and projecting from each of said disks and severally into a common and parallel plane therewith, and a radial finger, W, having button-head U, and which is loose upon and free to be swung about and also to be moved along the length of said arbor for being thereby placed into and out of the common plane of said projecting disk-pins X, substantially as described, for the purpose specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ADOLPH BERRENBURG.

Witnesses:

ALBERT W. BROWN,
KATE E. BELLOWS.