

E. G. CHORMANN.

Gearings.

No. 134,642.

Patented Jan. 7, 1873.

Fig 1

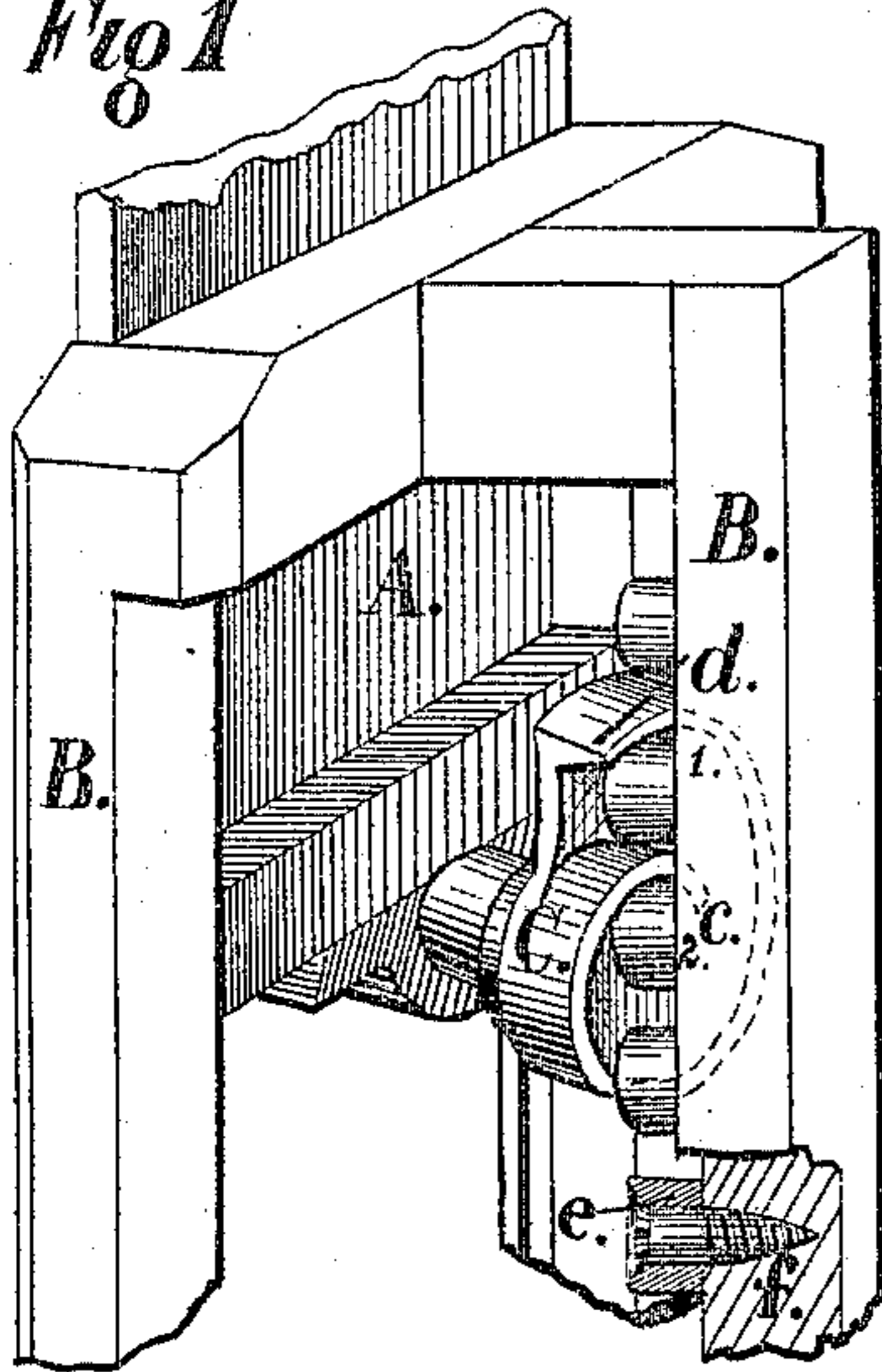


Fig 2

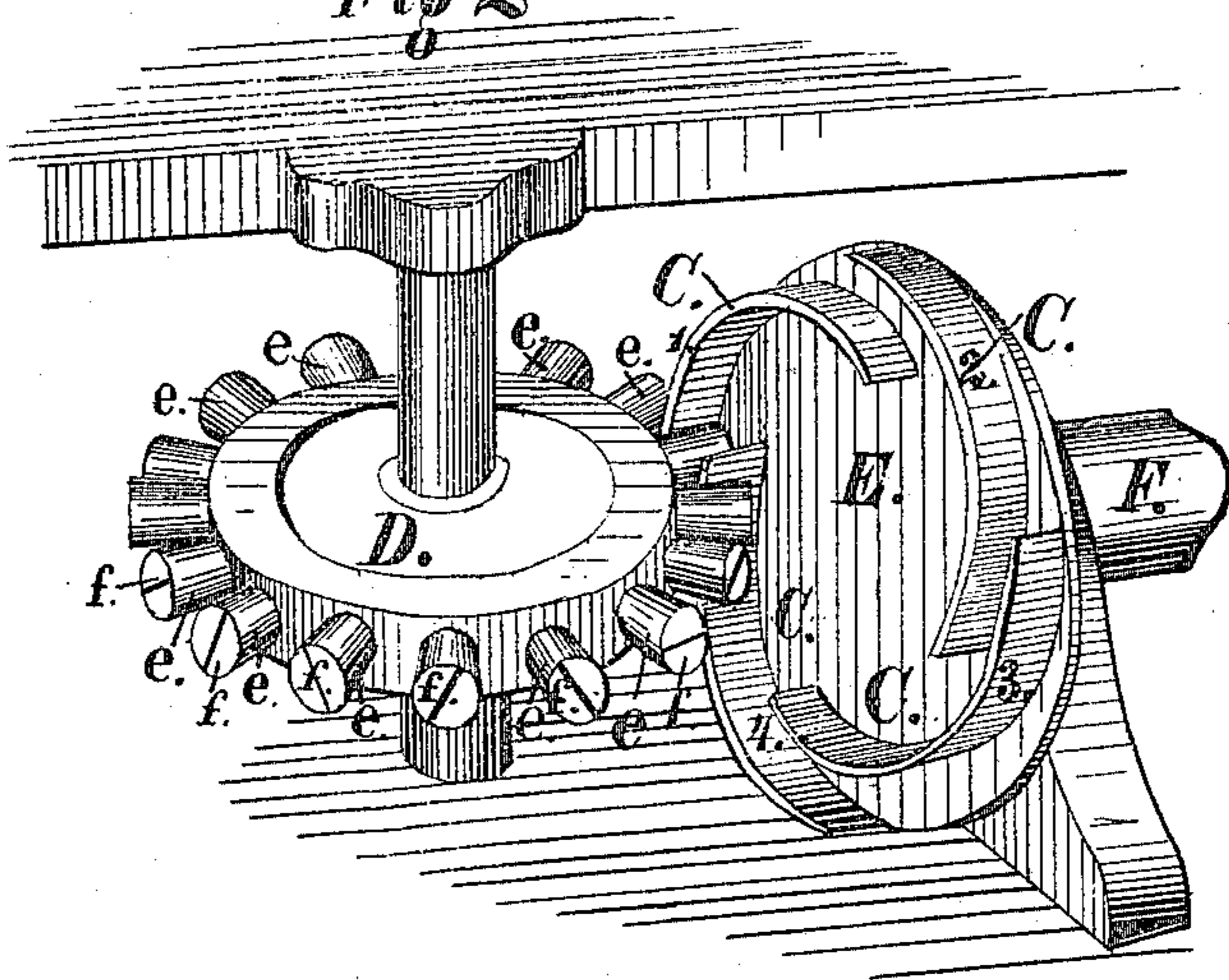
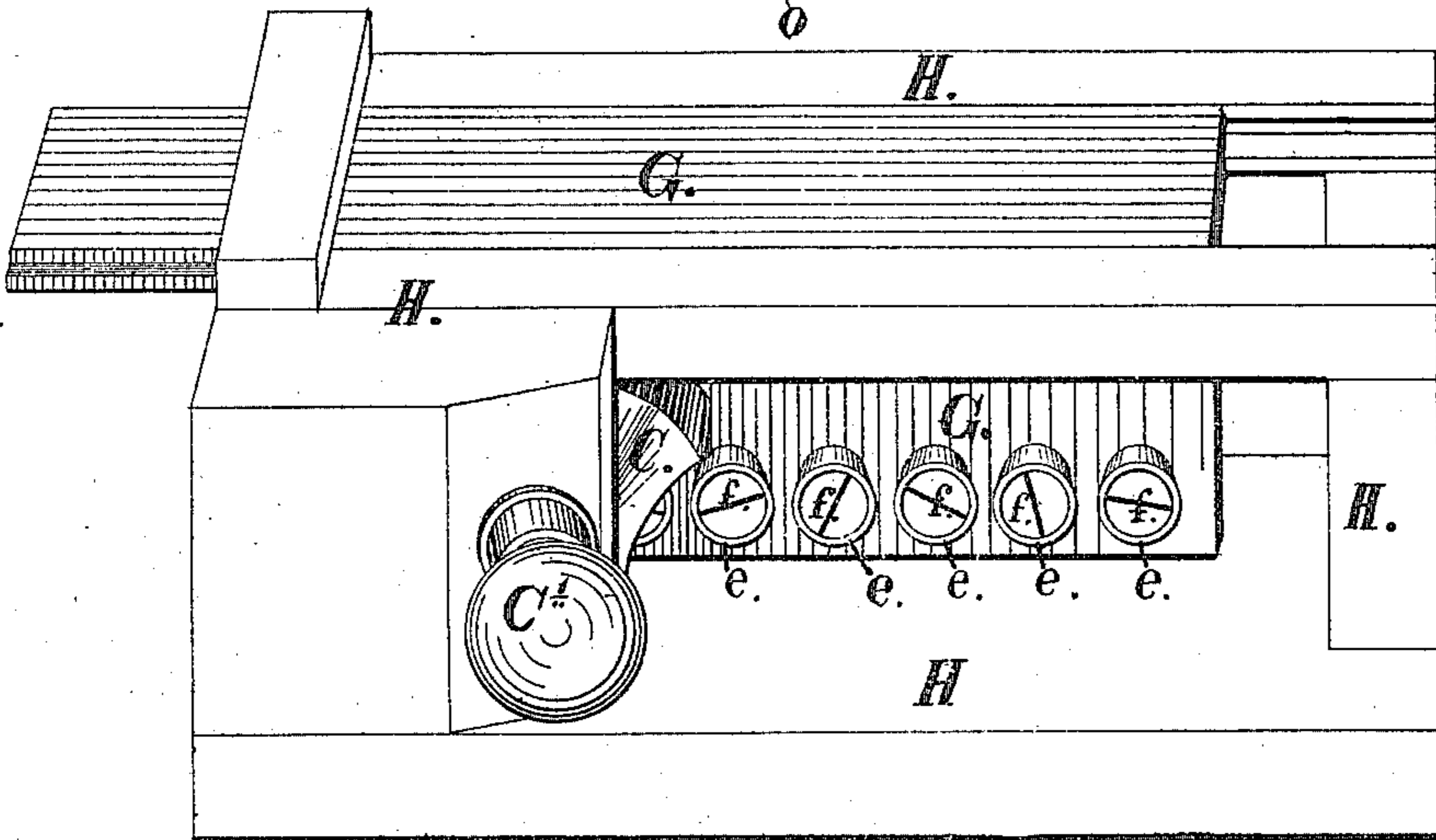


Fig 3



Witnesses:

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Alex. M. Stout.

Inventor:

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by W. M. Stewart, Attorney.

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Fig 4

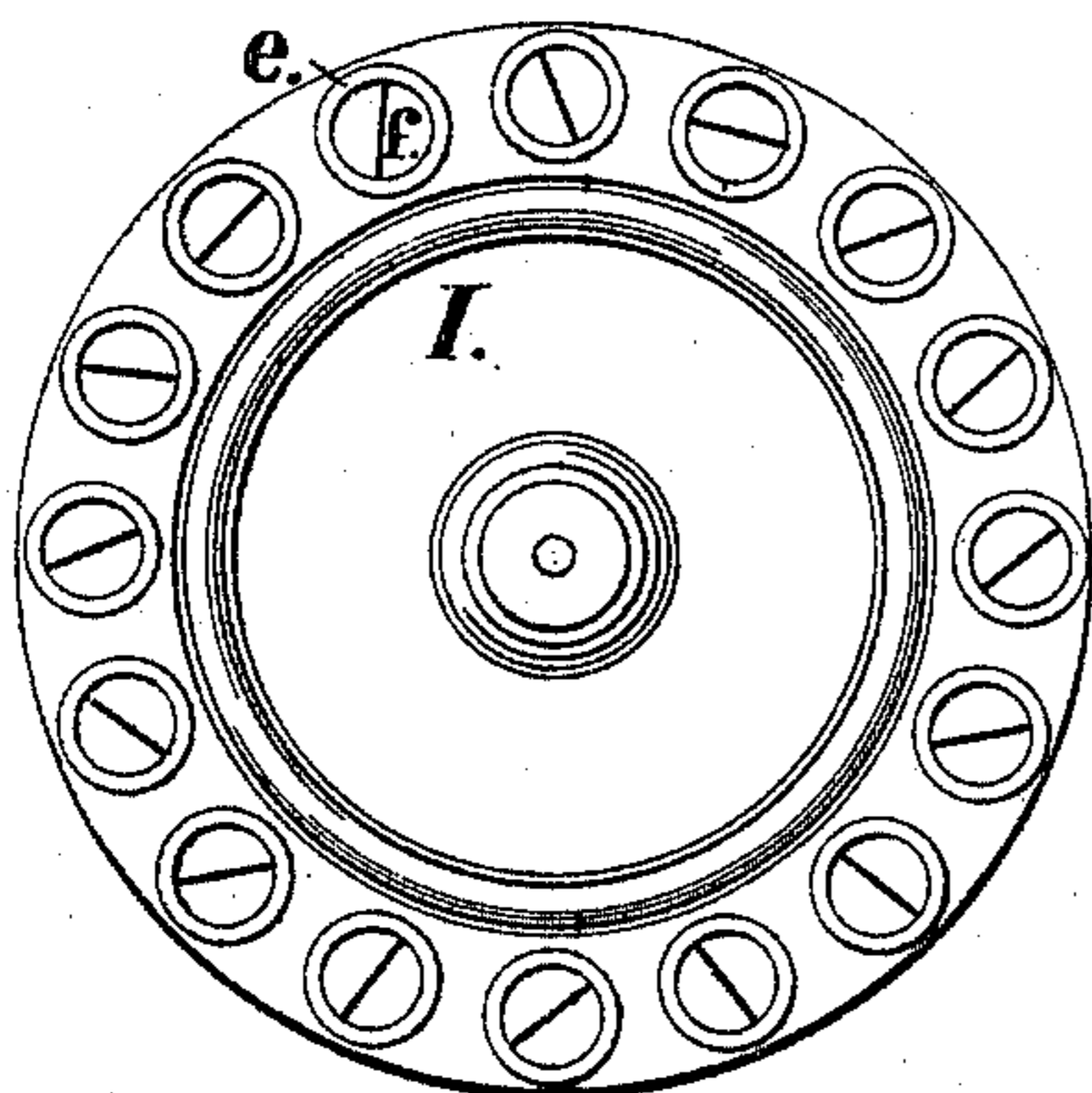


Fig 5

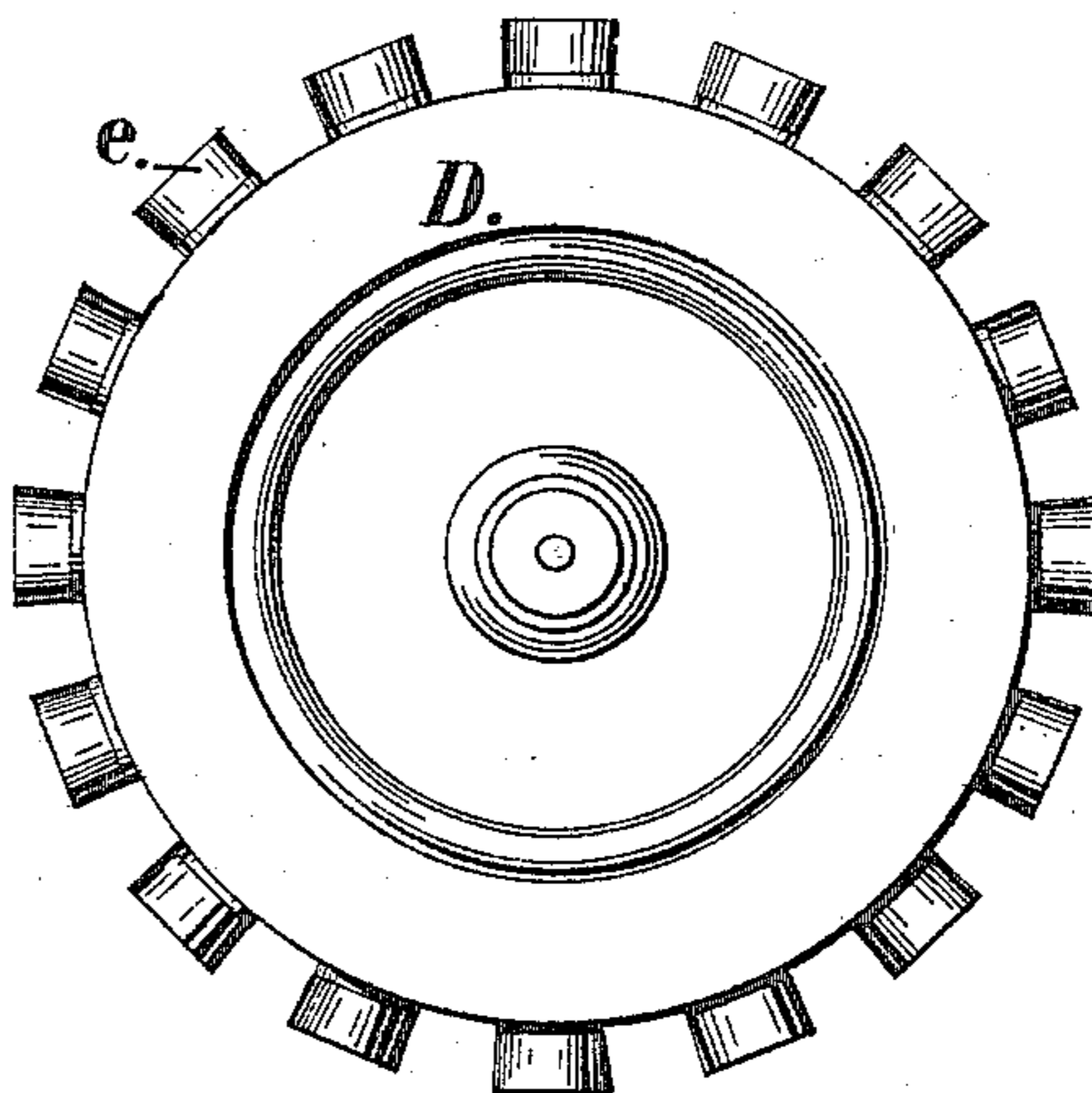


Fig 6

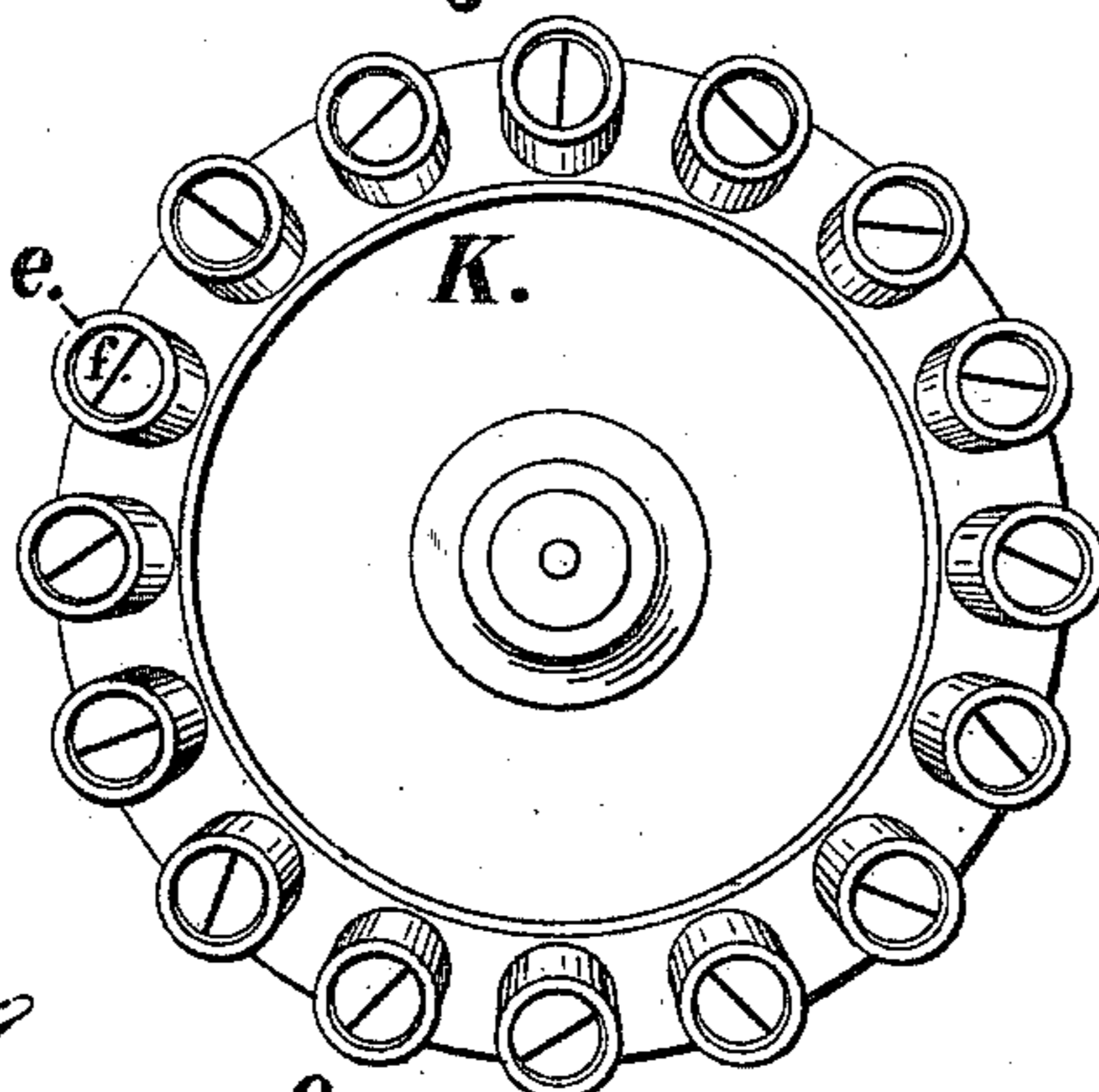


Fig 8

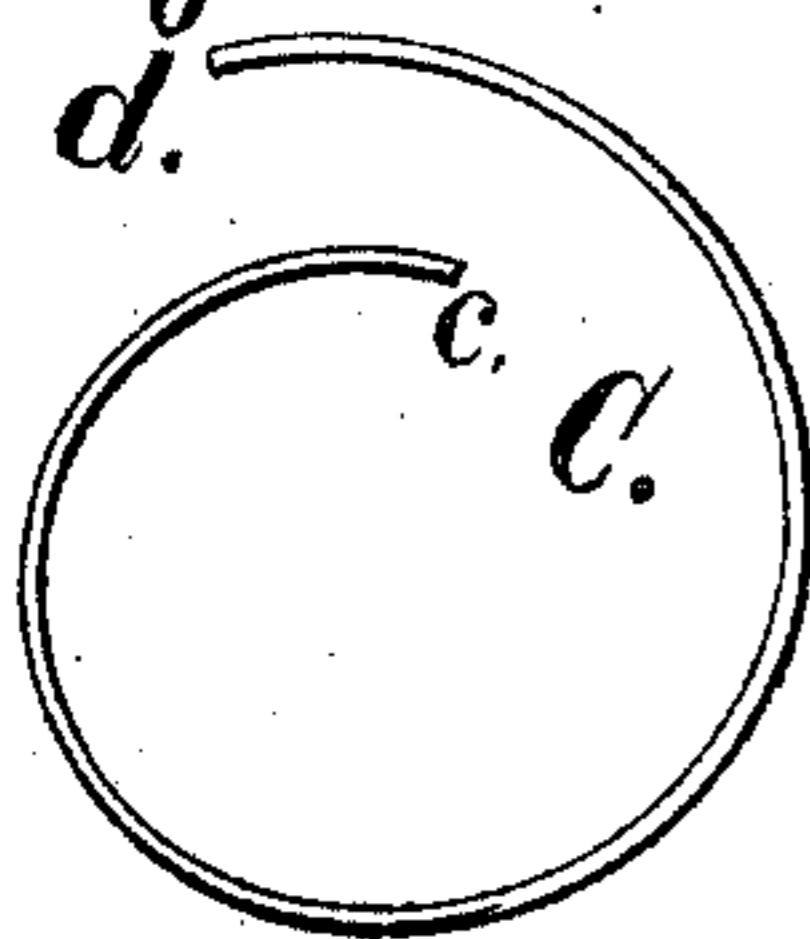


Fig 9

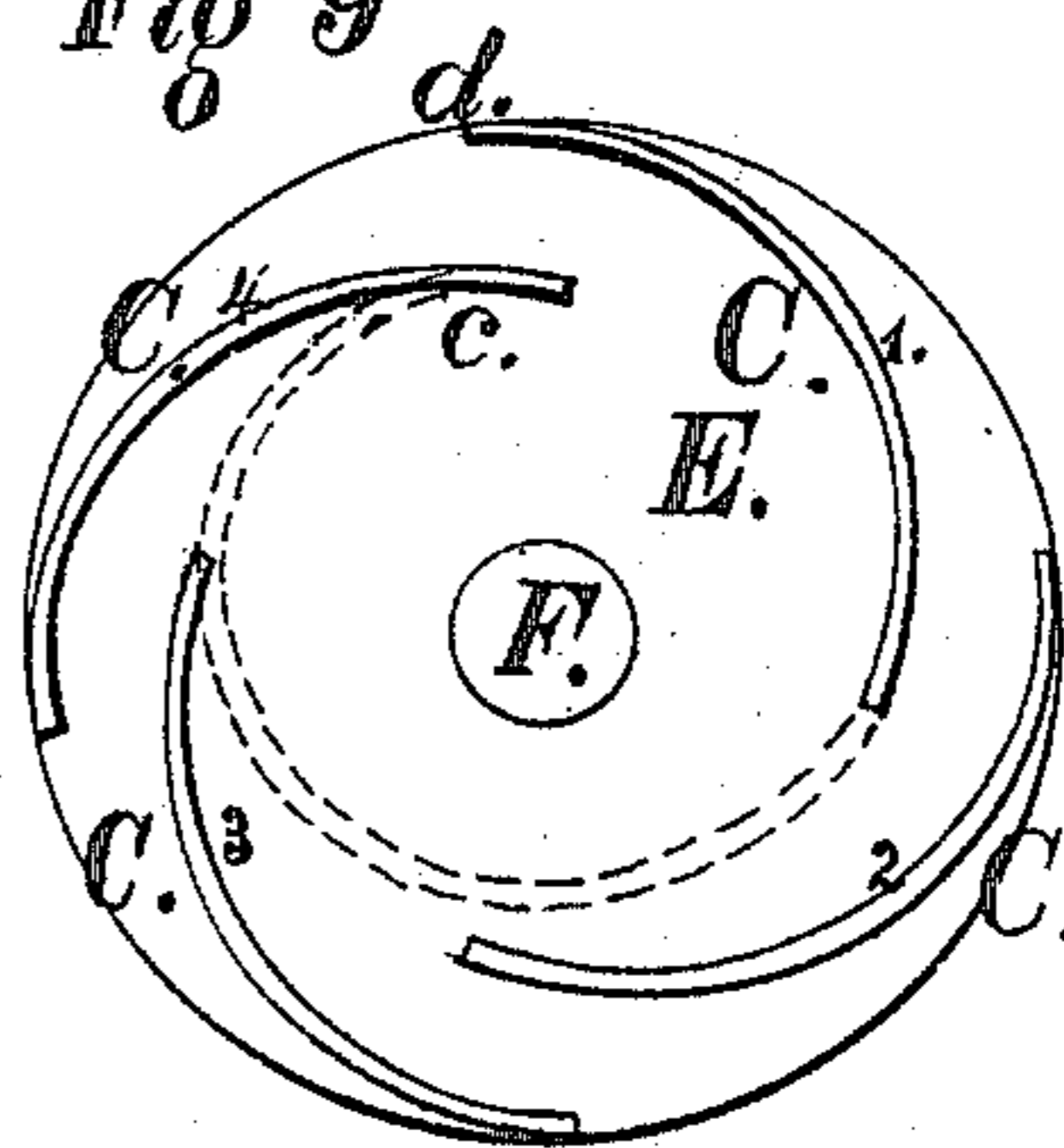
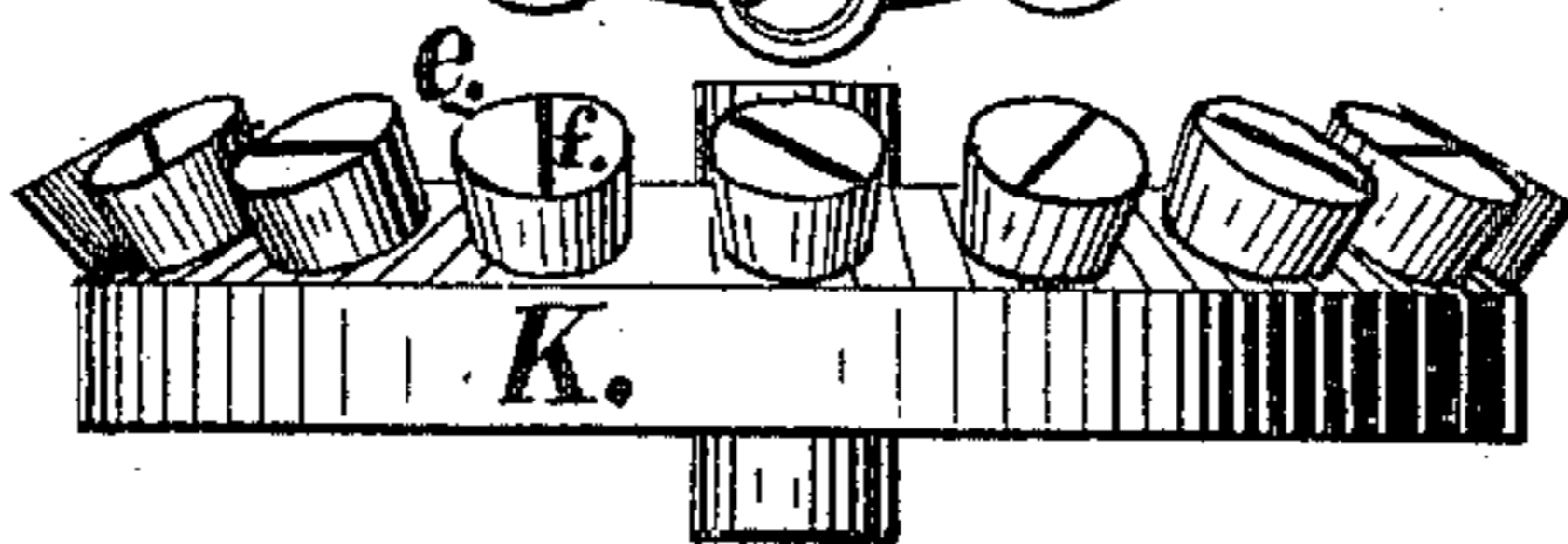


Fig 7



Witnesses:

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Inventor:

Ernest G. Chormann,
By A. M. Stout, Attorney.

UNITED STATES PATENT OFFICE.

ERNEST G. CHORMANN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN GEARINGS.

Specification forming part of Letters Patent No. 134,642, dated January 7, 1873.

To all whom it may concern:

Be it known that I, ERNEST G. CHORMANN, of Philadelphia, county of Philadelphia and State of Pennsylvania, have invented a Mechanical Device, of which the following is a specification:

The first part of my invention relates to the form and construction of a mechanical device to be used for revolving wheels, sliding frames back and forth, and elevating and depressing bodies not only in vertical lines, but in lines at any angle with the horizon, and the movement produced is not only regular and uniform, but the device becomes, to a certain extent, self-locked the instant the application of motive power to it ceases. The essential feature of the device is a plate coiled into a form much like that of the shell of a snail; or, in other words, the plate, from its outer end, constantly and regularly increases the degree or pitch of its curvature until its inner end is reached; and this plate is fastened with one of its edges against the face of a disk-formed plate, which is attached to the end of a shaft, by means of which the disk is revolved and the device caused to travel over pins or cogs either upon plane surfaces or upon the peripheries of wheels. The construction of the coiled plate in one piece is only one form in which I construct the device. Another, and perhaps a more useful, form is to have two or more of such plates, having the peculiar curvature described, so fastened upon the disk or head plate. The principle of action will be the same in both constructions, and that principle of action will be more fully explained hereinafter. The second part of my invention relates to the peculiar form which I give to rollers which I mount upon such cogs or pins for the purpose of diminishing friction.

In the accompanying drawing, Figure 1 represents a perspective view of the device, the curved plate being in one piece, in connection with pins having rollers upon them, arranged in a vertical straight line, equidistant from each other, upon an upright beam or post, the device itself being fastened upon the end of a shaft having its bearings in a frame provided with ways, so that it will move up or down, accordingly as the device may be turned to the right or left. Fig. 2 represents a like view of the device made with several equal sections

or pieces of the curved plate instead of one, in connection with a wheel having pins, teeth, or cogs, provided with rollers on its periphery and revolving horizontally upon a vertical shaft. Fig. 3 represents a like view of the device so arranged that when it is revolved upon its shaft it communicates horizontal motion to a frame, G. Figs. 4, 5, 6, and 7 represent views of wheels having the pins and rollers placed in different positions, showing how the pins may be placed on the periphery, the side, or beveled edge of a wheel. Fig. 8 represents a front-edge view of the snail-formed plate. Fig. 9 represents a front view of the disk or head plate, and shows the form and arrangement of the curved plates thereon.

Whenever the device is used in connection with pins upon a plane it will be necessary that the device shall have a certain degree of inclination to that plane, as shown in Fig. 1, in order that the inner end *c* of the snail *C* may free itself from pin No. 2 upon the outer end *d*, mounting upon pin No. 1; but when in connection with a wheel like *D*, Fig. 2, such inclination is obviously not necessary. In order to meet and correspond with that inclination the rollers *e* upon the pins *f* are made in the form of a frustum of a cone with the base outward; and, such being their form, when the device is operated and the plate *C* travels over them, it comes in full contact with them from the inner to the other edge, and, of course, the wear is much less than it would otherwise be. This construction of roller is useful, for similar reasons, when the form of device shown in Fig. 2 is used, whether in connection with pins upon a wheel or plane.

The amount of the inclination before mentioned, the length and distance apart of the pins, and the dimensions of the snail *C* have a mutual dependence upon each other, to arrange which is a matter of mechanical skill merely, and is no part of this my invention.

One of the objects of my invention is to secure a steady and uniform movement. This has been secured by the peculiar form and action of the snail. For instance: Referring to Fig. 1, the upper end *d* of the snail *C* commenced to travel on pins No. 2, and as the device was turned to the right the device was bound to rise and carry up with it the frame *A*, because of the gradually and constantly in-

creasing curvature of the snail, until, having made an entire revolution, it extended above pin No. 1 without touching it, and then, upon being extended further, it touched it, and then bore upon it with increasing weight until it bore its whole weight upon pin No. 1, and, at the same time, let go pin No. 2 by a gradually-diminished pressure, so that, if the device be properly constructed and arranged, there is no cessation or irregularity of motion imparted during the operation of the device.

Having reference to Fig. 2, each section of the snail C travels over and moves a pin a certain distance, and gradually diminishes its pressure upon a pin just as a succeeding section passes over and comes in contact with another and a succeeding pin, and gradually transfers the pressure of the device to it.

Of course, there may be as many of these sections upon a single disk as can be used to advantage without departing from the spirit of my invention.

I am aware that W. F. Sampson, on the 10th March, 1866, filed his application for Letters Patent for an elevator, (which was rejected,) in which he describes and shows a device which he calls a scroll-pinion, which consists of a disk similar to my head-plate E, having fixed upon its face three flanges of such length that, when curved, each laps upon itself; and they are so arranged in reference to each other upon the face of the disk that they run in lines that are parallel to each other and inclose spaces that are uniform in width. I am also aware that

Otis Tuft filed his application for an improved hoisting apparatus December 1, 1860, (which was also rejected,) his device consisting of a like head-plate, with a single flange coiled more than twice thereon in such a manner as to leave a space of uniform width between its coils from one of the flanges to the other. Now, I utterly disclaim the construction shown in both of these applications, for, besides failing to produce the smooth and unbroken movement which my device succeeds in producing, the flanges of Sampson and Tuft are so long that two or more revolutions of the device are required to move each cog, pin, or tooth; but the point of excellence in my device is that the curve in my flange-plate C is not regular, but the pitch of the same increases regularly from beginning at the outer end to ending at the inner end, however long or short it may be; and the spaces, therefore, between its coils, or between sections of it on the disk E, are not uniform in width.

What I claim, therefore, as my invention is—

1. The device composed of the head-plate E and the flanges C, one or more in number, having the peculiar curvature described, substantially as and for the purpose set forth.

2. The rollers *e* mounted upon pins *f*, in combination with the device E C, constructed substantially as and for the purpose described.

E. G. CHORMANN.

Witnesses:

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