

(No Model.)

2 Sheets—Sheet 1.

J. P. KIDDER.
KNITTING MACHINE.

No. 274,947.

Patented Apr. 3, 1883.

Fig. 1.

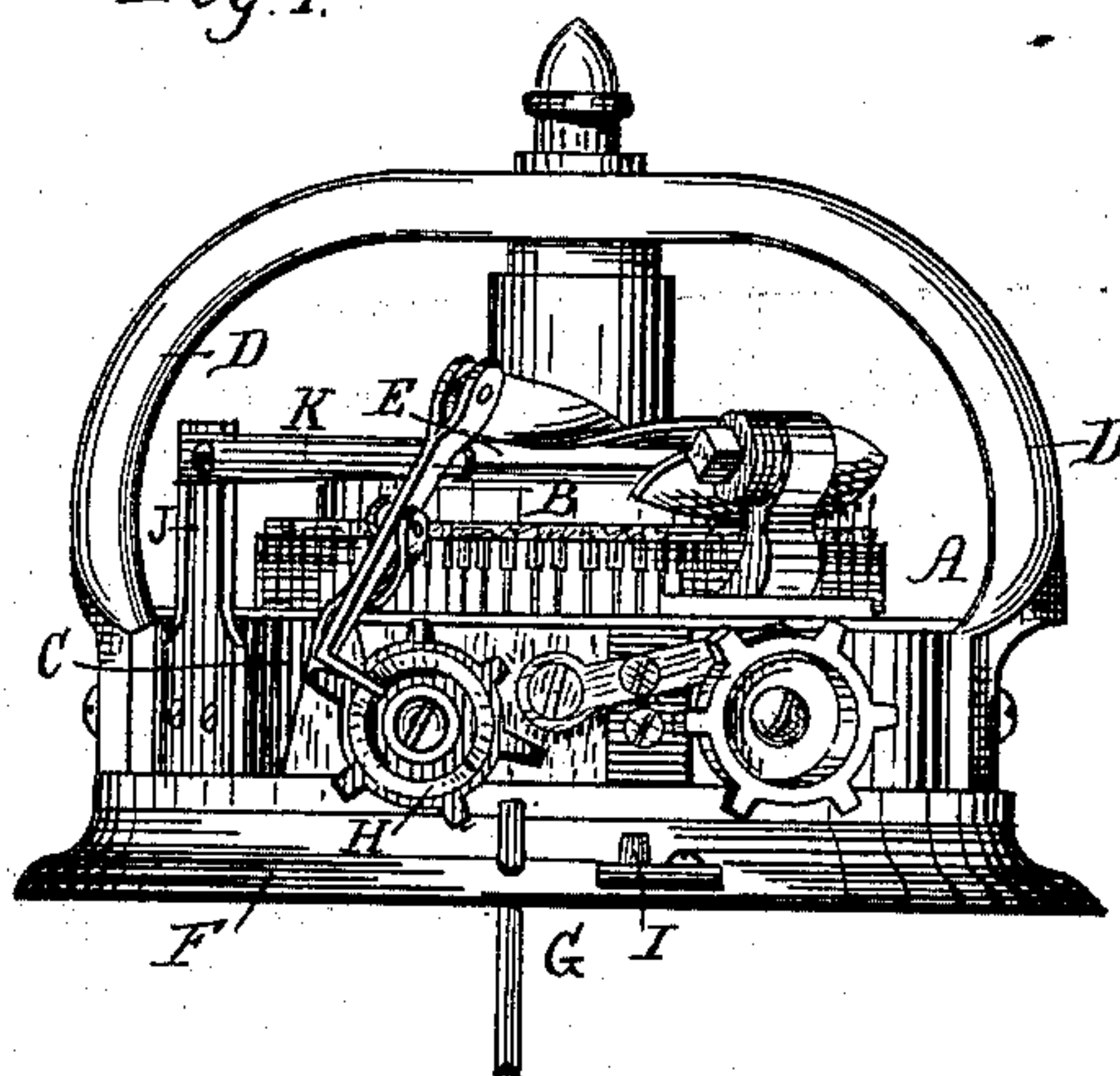


Fig. 2.

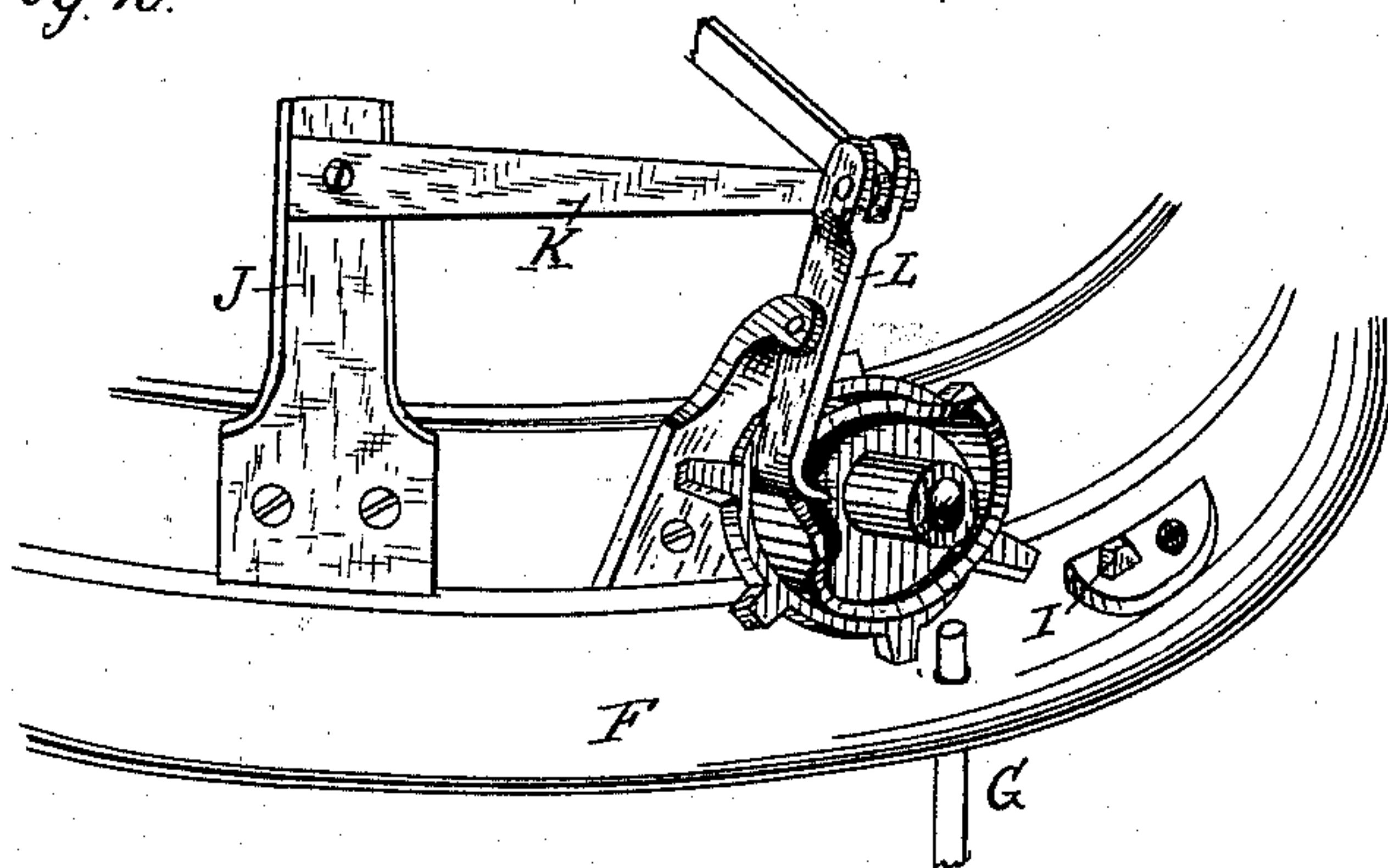


Fig. 3.

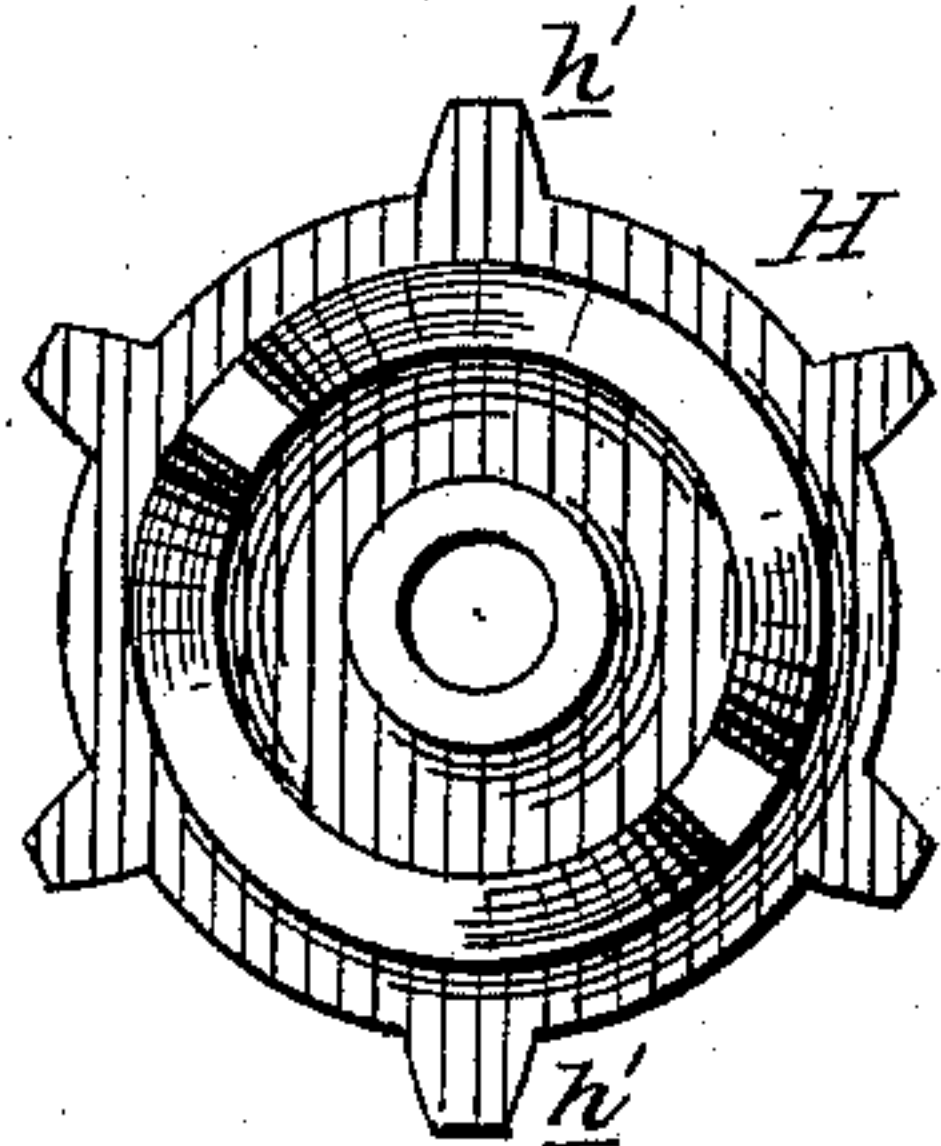


Fig. 4.

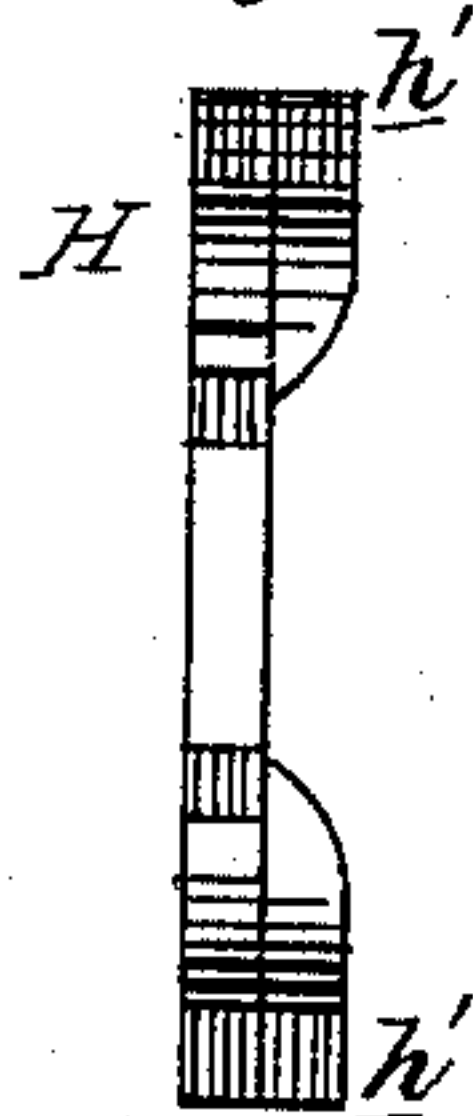
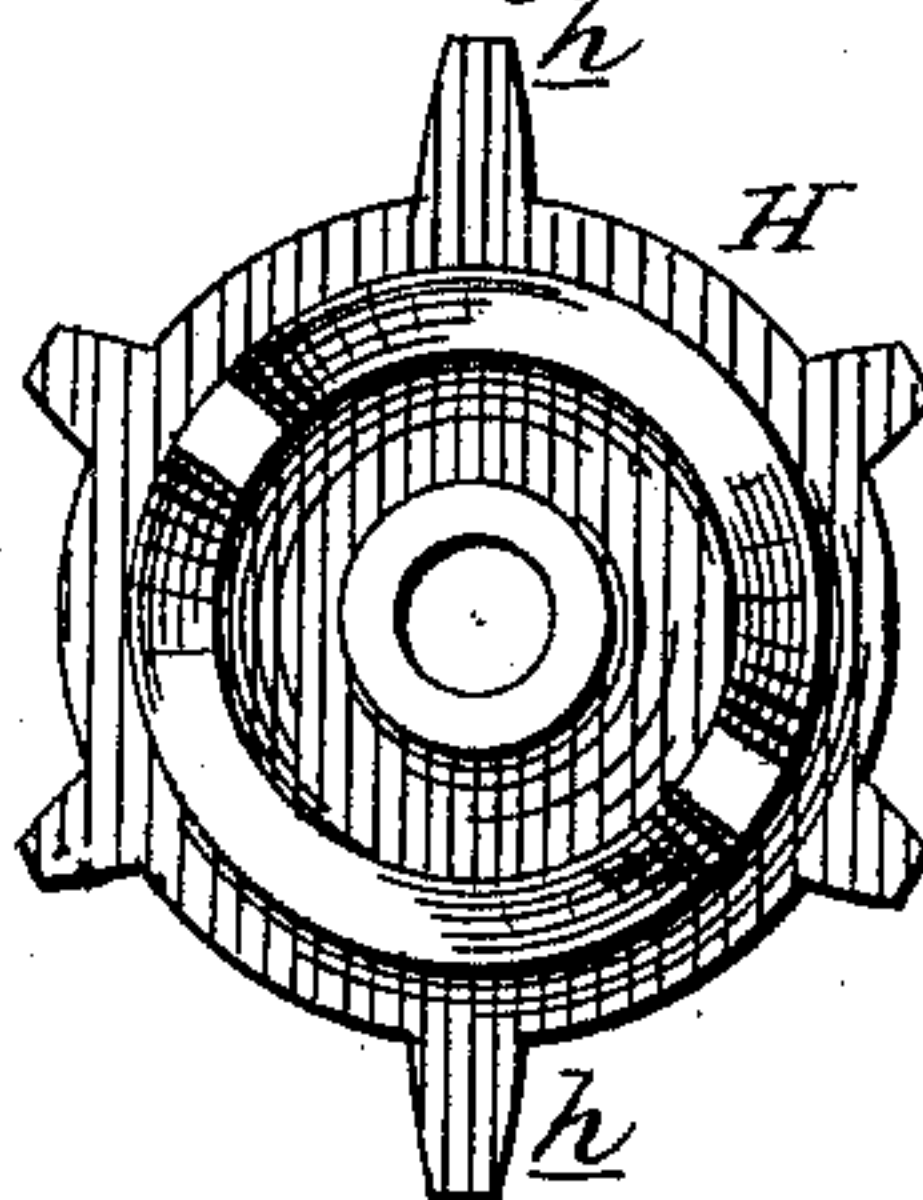


Fig. 5.



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Fig. 7.

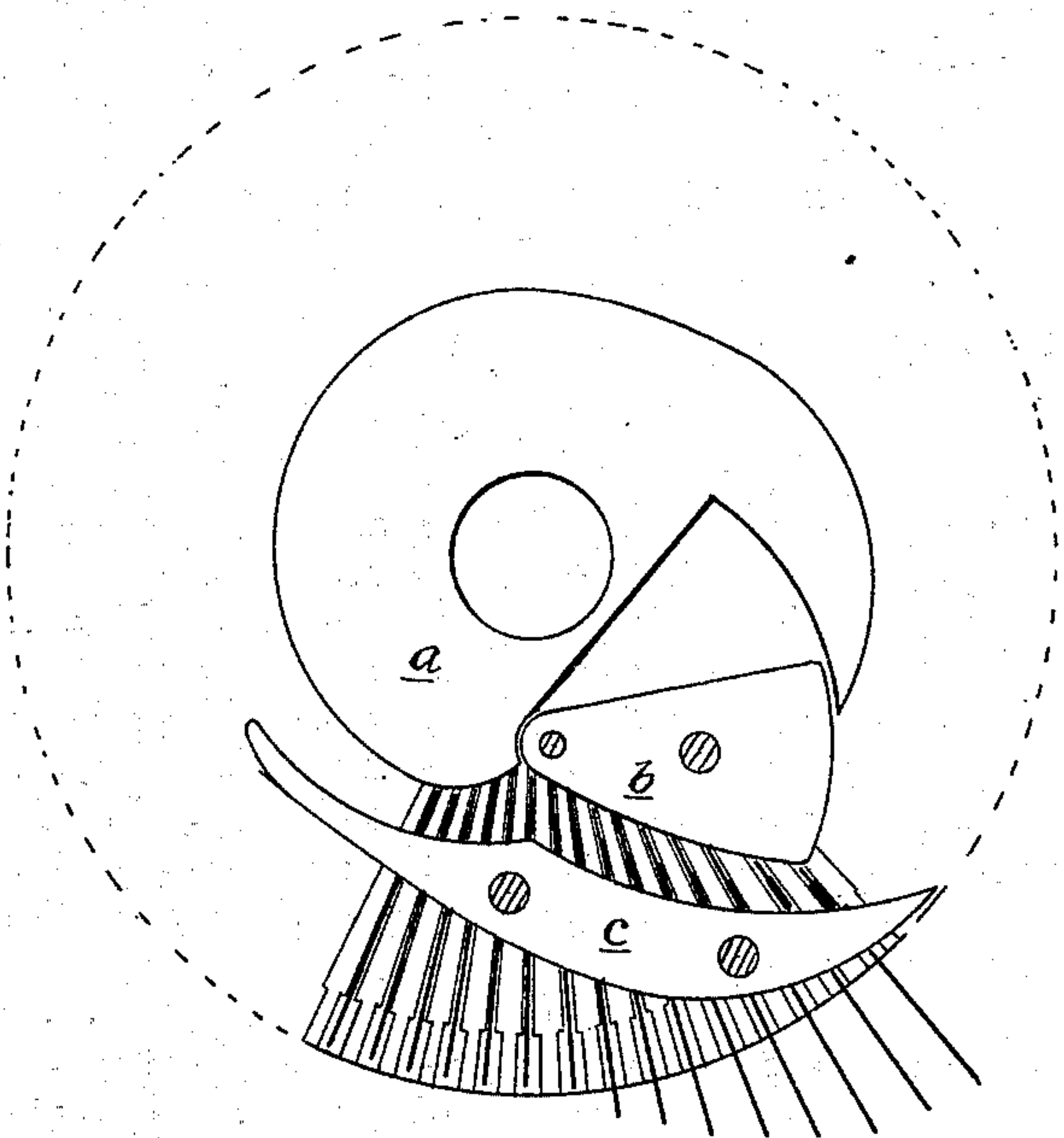


Fig. 8.

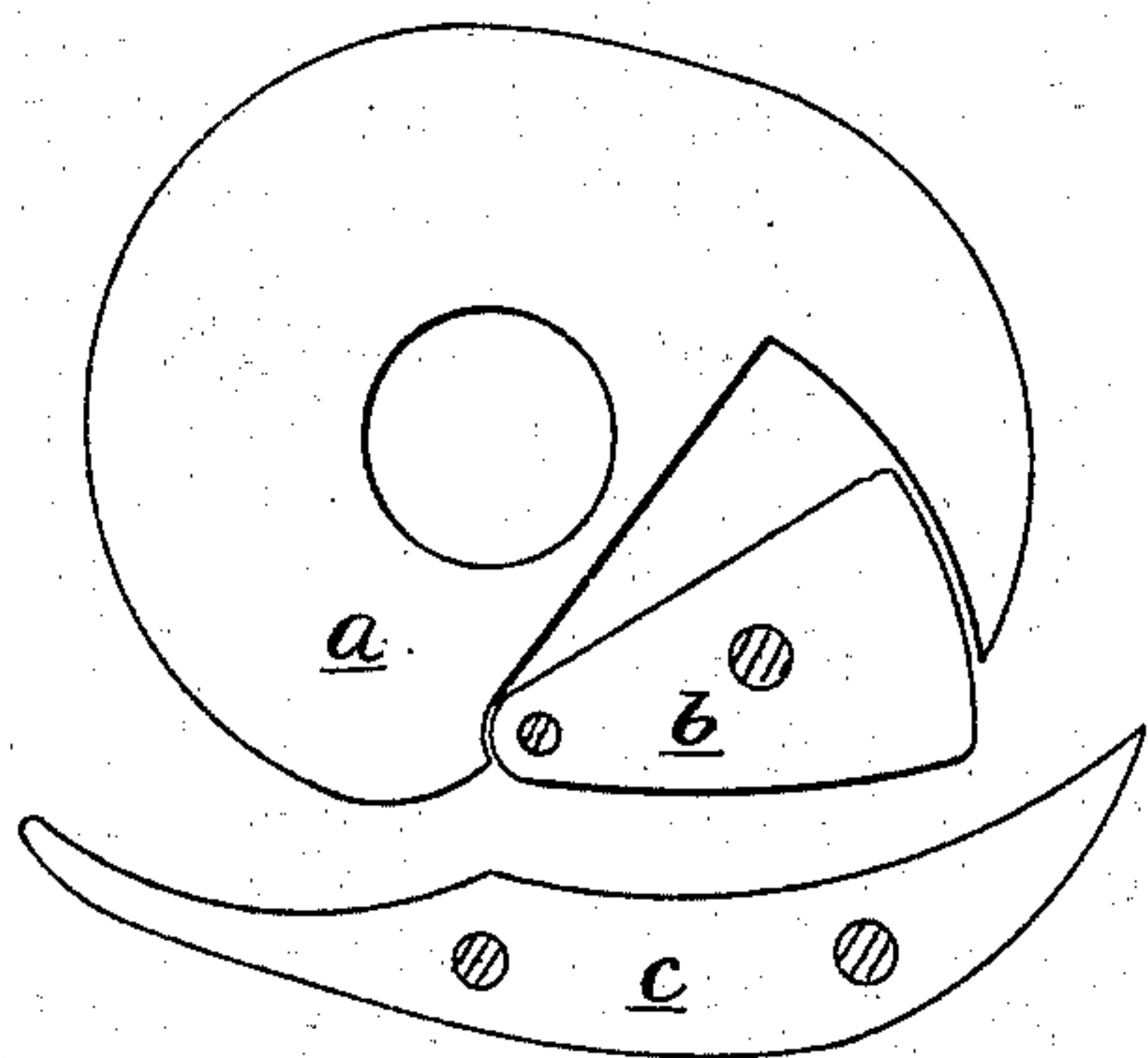
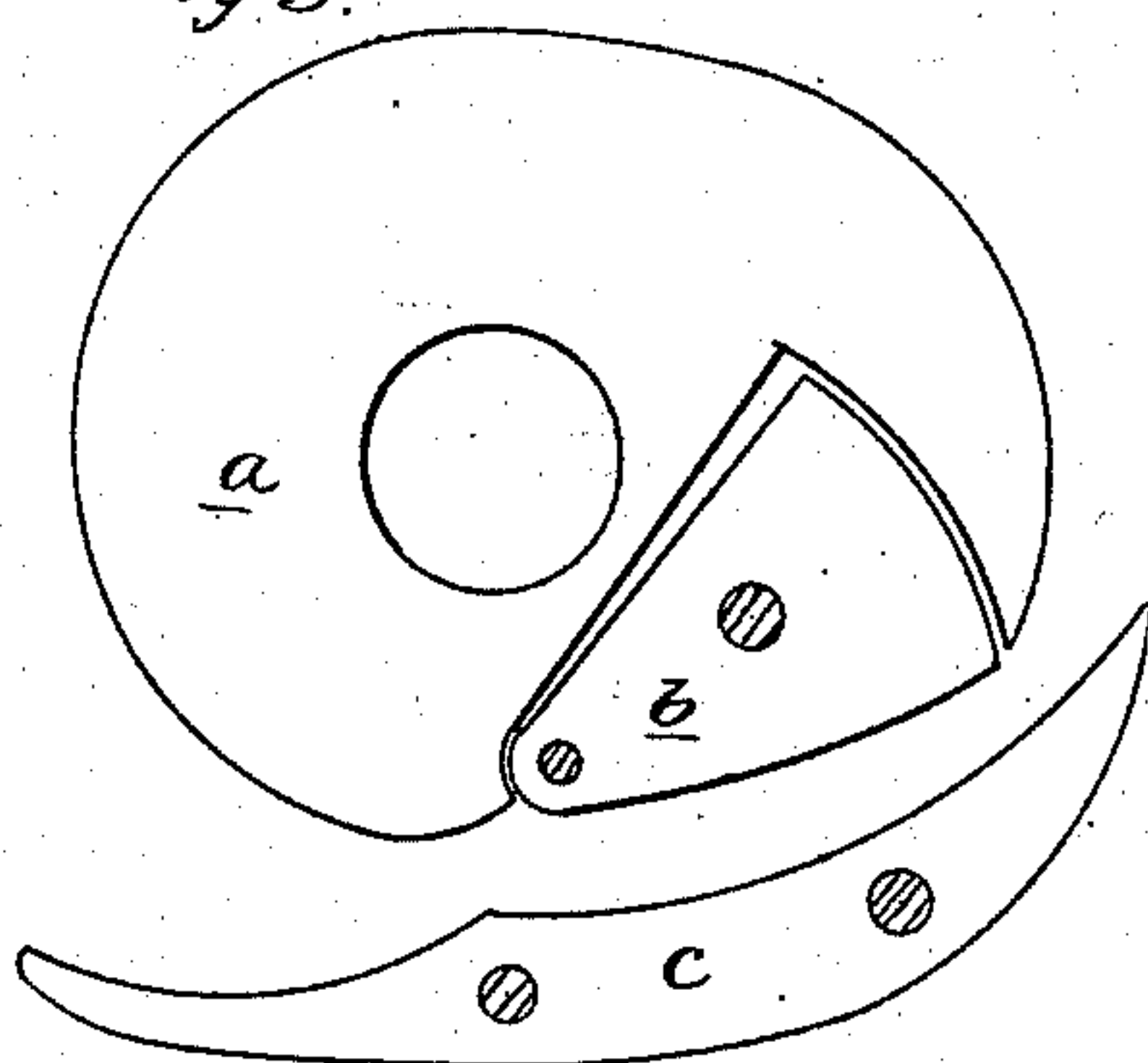
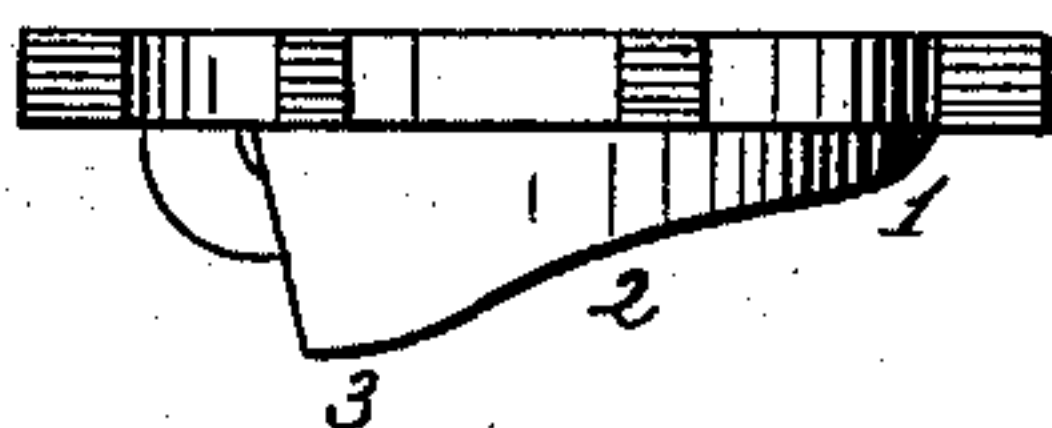


Fig. 9.



H Fig. 6.



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UNITED STATES PATENT OFFICE.

JEPHTHER P. KIDDER, OF PHILMONT, ASSIGNOR OF ONE-HALF TO GEO. W. MOSELY, OF HUDSON, NEW YORK.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 274,947, dated April 3, 1883.

Application filed January 30, 1882. (No model.)

To all whom it may concern:

Be it known that I, JEPHTHER P. KIDDER, a citizen of the United States, residing at Philmont, in the county of Columbia and State of New York, have invented certain new and useful Improvements in Knitting-Machines, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved knitting-machine; Fig. 2, a perspective view of a portion thereof; Fig. 3, a detail view of a modification of the cam-wheel; Fig. 4, a side view of Fig. 3; Fig. 5, a detail enlarged view of the cam-wheel shown in Figs. 1 and 2; Fig. 6, a side view of the cam-wheel, showing one of the cams; and Figs. 7, 8, and 9 are diagram views of the dial-moving cams in different positions in which they are moved by the cam-wheel and cam-lever.

My invention relates to that class of circular-knitting machines of which the Patent No. 239,169, to W. D. Huse, March 22, 1881, shows a specimen; and the novelty consists in the construction and arrangement of parts, as will be more fully hereinafter set forth, and specifically pointed out in the claims.

The accompanying drawings represent some of the essential elements of a circular-knitting machine in which two sets of needles are employed, one being a set of vertical needles mounted in a cylinder, A, and the other a set of horizontal needles mounted radially in a dial-plate, B, both sets of needles being driven, in a manner well understood, by means of a ring, C, yoke D, and cam-plate E, and cams *a b c*, as fully shown and explained in the Huse patent, and it is therefore unnecessary to further describe them.

Attached to the ring C is the cam-wheel H, made in this instance with six cogs, two of which are enlarged by lengthening, as shown at *h h*, or being made wider, as at *h' h'*; but in other respects the wheel is the same as the corresponding part in the Huse patent, and is used for operating the lever that throws the dial-needles out of action in the same way.

At F is the base of the machine, through

which rises the movable stop G, which is operated and operates in essentially the same way as in the Huse machine.

At I is a stop firmly and fixedly attached to the base F, and is so arranged and proportioned that it will not affect the small teeth of the cam-wheel H, which will readily pass by it without touching it, but will act on the enlarged teeth when they are brought into position.

Attached to a standard, J, rising from the ring C is a spring, K, which, pressing on the back of the cam-lever L, forces the dial-needles instantly into action. Instead of the flat spring shown, a spiral or some other form of spring may be connected with the lever.

When the machine is in operation the cam-wheel passes clear of both the movable and fixed stops until the former is raised, when one of the small teeth comes in contact with the stop and turns the cam-wheel one tooth, or one-sixth of a revolution, which gives the cam-lever one-half of its motion in one direction and causes the next large tooth to assume the position shown in Fig. 5 when it comes in contact with the fixed stop I, and the wheel is moved another tooth, thus giving said wheel a movement equal to the space of two teeth in rapid succession, instead of requiring a revolution for the movement of each tooth. By this means the cam-lever has its entire motion given to it in one direction, while the ring C is moved but a short portion of its circumference, and thus each dial-needle is suddenly and entirely thrown out of action, so that by this means only one row of stitches is formed on the horizontal needles, while three are formed on the vertical needles, and when the continued operation of the movable stop G has turned the cam-wheel H one more tooth, making one-half of a revolution, the spring K, operating on the cam-lever L, throws the dial-needles instantly into action, when the loops that have been held on them during the time that they have been out of operation are knitted into the loops formed from the yarn now laid into said horizontal needles, by which means a close welt or binding is formed, which will be found

to be particularly adapted for use on the tops of hose or the wristbands of shirts, bottoms of drawers, &c.

As a movable stop is only required to move the cam-wheel H a comparatively short distance (one tooth) when throwing the needles into action, it will be seen that it is necessary to provide means for moving it double that distance, or two teeth, when it is desired to throw the needles entirely out of action at one movement of the machine.

In order that the operation of the cams may be more clearly understood, I have shown them, in Figs. 7, 8, and 9, in the various positions in which they are moved by the cam-wheel and the lever-connections. When the end of the lever L rests at the lowest portion of the cam-wheel at 1, Fig. 6, the dial-cams *b c* are in the position shown in Fig. 7; but when the cam-wheel has been moved one tooth by the movable stop the lever rests at 2 and moves the dial-cams *b c* to the position shown in Fig. 8, which, however, is only a temporary position, as the continued rotation of the cam-wheel, caused by the action of the stationary stop L upon the lengthened or widened tooth of the cam-wheel, causes the further movement of the same, so as to bring the end of the lever to the point 3 and move the dial-cams *b c* to the limit of their inward movement, as shown in Fig. 9. At this point the dial-needles are so far inward that they will take no thread in the rotation of the machine, and they remain in this position until the cam-wheel is moved a single tooth by the movable stop, so that the spring K will forcibly throw the cams *b c* and the dial-needles outward into the position from which they started to again take thread and form stitches in the regular manner.

From the above it will be seen that in my machine the action of the movable stop G and the fixed stop I against the cam-wheel moves the dial-needles entirely out of action at a single revolution of the machine, and the spring K instantly and forcibly throws them out again when the cam-wheel is again turned, whereas in the machines heretofore used the cams are moved into the position shown in Fig. 8, in one revolution of the machine, at which they take the thread but do not cast the loops they already have over their latches, and it is necessary to make a second revolution of the machine in order to cause the cams to assume the position shown in Fig. 9, in which position of the cams

the needles can neither take thread nor cast off loops.

In the former machines the outward movement of the cams when they are again released is not instantaneous, but is gradual, and is not complete until about ten stitches have been formed, this being caused by relying on the action of the needles in the movement of the machine to operate said cams.

I do not wish to limit myself to the exact number of teeth shown in the cam-wheel, as it might be made with three small teeth and one larger one, or with three or four large teeth, or even more, and with corresponding sets of small teeth, in which case the number of cams on its side should be made to correspond with the number of large teeth.

What I claim as new is—

1. The combination, with the cams for moving the dial-needles, of the cam-wheel H, provided with a cam or cams for operating the dial-cams, and with peripheral teeth of different sizes, and means, substantially as described, for differentially operating the cam-wheel, as set forth.

2. The combination, with the dial-cams for moving dial-needles, of the cam-wheel H, provided with a cam or cams for moving said dial-cams, and with large and small teeth, the movable stop G, for operating upon the small teeth of the cam-wheel, and the fixed stop I, for operating upon the large teeth, substantially as described.

3. The combination, with a knitting-machine provided with vertical and horizontal needles, of a cam-wheel provided with small and enlarged teeth, suitable connections between said wheel and the movable dial-needle cams, and movable and fixed stops constructed to operate on the wheel, substantially as described.

4. The combination, with the dial-cams, of a cam-wheel for moving the dial-cams inward, and a spring for forcibly and quickly moving the said dial-cams outward, substantially as described.

In testimony whereof I affix my signature in presence of three witnesses.

JEPHTHER P. KIDDER.

Witnesses:

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GEORGE W. MOSELY,
EDWARD C. WHEELER.

E. C. W.